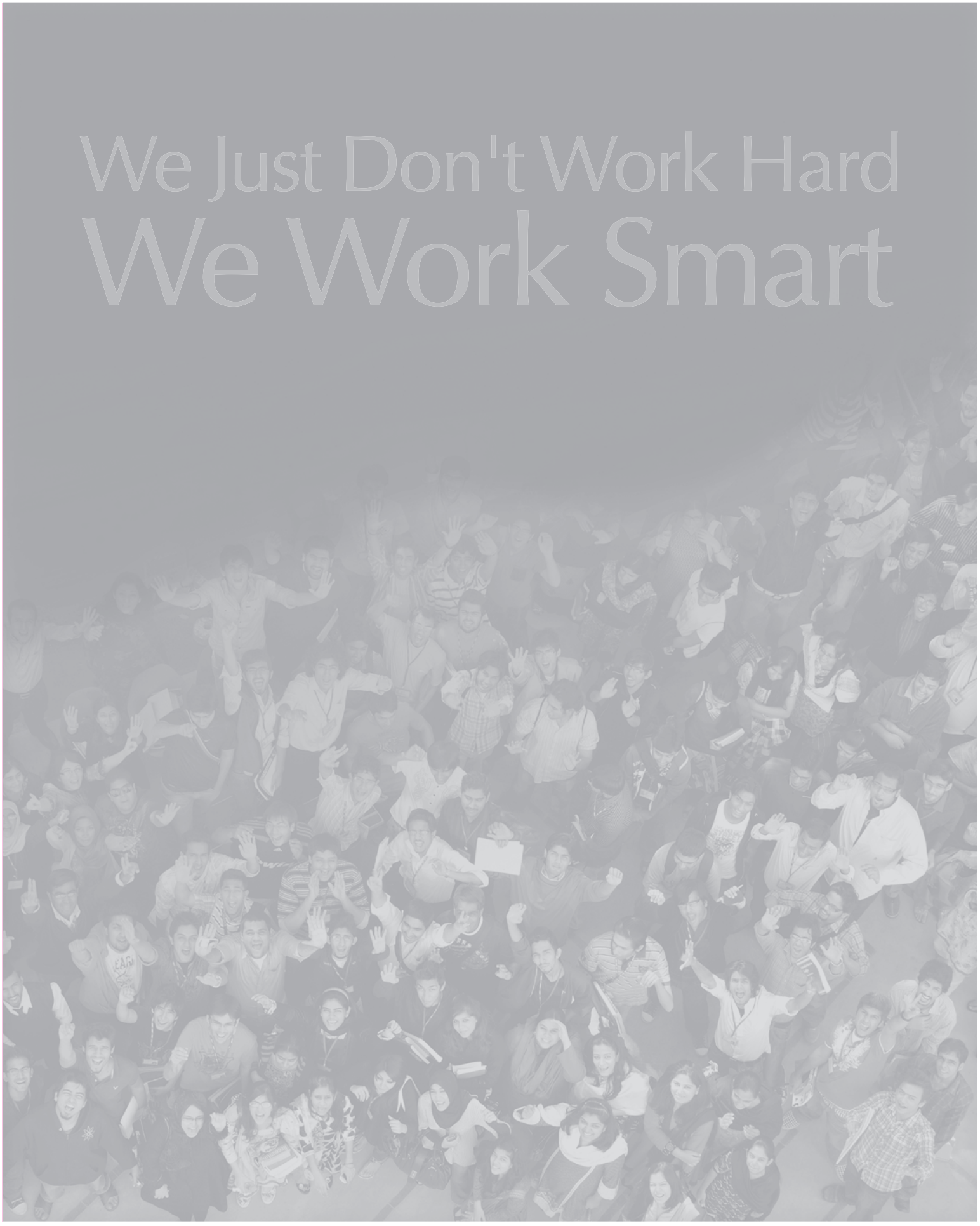
SZABIST

Shaheed Zulfikar Ali Bhutto
Institute of Science & Technology
KARACHI CAMPUS

Discover
Yourself

Course Catalogue 2021

We Just Don't Work Hard
We Work Smart



Course Catalogue 2021

The Vision

SZABIST aims to be a globally recognized institute for excellence in education, research, development, and distinction in service.

The Mission

SZABIST is committed to produce highly qualified professionals to:

- Meet national and global contemporary needs;
- Conduct cutting edge research and development;
- Provide hi-tech scientific and technological expertise;
- Meet current and future socio-economic challenges;
- Meet global citizenship responsibility.

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About SZABIST

Shaheed Mohtarma Benazir Bhutto, the first woman Prime Minister of a Muslim country and twice elected Prime Minister of Pakistan founded SZABIST in 1989 to realize the vision of her father, former elected Prime Minister of Pakistan, Shaheed Zulfikar Ali Bhutto. In his speech at the inauguration ceremony of the Karachi Nuclear Power Plant in 1972, he stated:

"We will give science and technology requirements the highest priority and our attention. To implement any program of scientific and technological development, the country needs to train scientific manpower. In this, the schools, colleges and universities have to play their role. I desire that vast number of people of Pakistan should acquire technological skills. I want first-class science in Pakistan because nothing less is acceptable. And I wish Pakistan to be increasingly self-reliant in all aspects of technology".

It was in pursuit of this dream that SZABIST was established.

In its first academic year, 1995, SZABIST commenced studies by offering only two degrees i.e. MS in Software Engineering and Master of Business Administration with only 96 students. Since then, SZABIST has made tremendous progress and now offers programs in the disciplines of Management Sciences, Computer Science, Social Sciences, Media Sciences, Law, Mechatronics Engineering, Life Sciences, Public Health and Education.

SZABIST has five full-fledged university campuses; Karachi, Islamabad, Larkana, Hyderabad and Dubai, which makes it one of the degree granting institutions in Pakistan with an international presence.

Pursuit of research is an integral part of any educational institutions' life. In this regard, SZABIST pioneered Pakistan's first online research journal, Journal of Independent Studies and Research (JISR) in 2003. In 2009, SZABIST re-dedicated itself to its mission of research and development in science and technology with a number of new initiatives. These are focused on realizing the country's research potential, and developing long-term self-sufficiency in critical areas of energy, biomedicine and technology.

Reflecting its dedication to excellence, SZABIST continues to grow and prosper as a top ranked institution of higher education. This is a singular achievement for an institution, which relies solely on its own resources, and it certainly augurs well for its future.

Message by the Chancellor

I am pleased to welcome you all to Shaheed Zulfikar Ali Bhutto Institute of Science and Technology (SZABIST), a multidisciplinary institution ranked amongst the top universities of Pakistan because of its graduates employability, proficient faculty, competent staff and quality tertiary education.

Over the last 25 years, the institute has gained recognition nationally and internationally due to the holistic and market-relevant programs supplementing the academic, social, professional, and creative needs of its students. Further, in line with our commitment to provide contemporary tertiary level education the courses offered at SZABIST are regularly updated according to the market requirement and are fully compatible with the guidelines of the Higher Education Commission (HEC) of Pakistan.

The Course Catalogue 2021 is a quality tool designed for enhancing students understanding of the offered courses as it contains detailed and standardized description of courses in Management Sciences, Computer Science, Social Sciences, Media Sciences, Mechatronics, Life Sciences, Education and Law programs. The document will assist students in comprehending the respective degree completion requirements; it also illustrates a range of elective courses. In addition, the Course Catalogue helps Program Managers in guiding students to successfully complete their respective degree requirements.

I wish the students the very best for their academic life at SZABIST and urge them to follow the SZABIST motto, "Discover Yourself" to become the leaders of tomorrow.

Dr. Azra Fazal Pechuho
Chancellor,
SZABIST

Message by the President

Welcome to SZABIST! I congratulate you on being selected at SZABIST, a highly rated Business and Technological institute with a tradition of producing high quality corporate leaders.

At SZABIST, the Board of Trustees, Management, Faculty and Staff are committed to impart professionally enriching, market-related and socially beneficial skills through affordable high quality tertiary education. We believe your education is vital, not just for your future, but for the future of our community and economy.

In order to assist you for successful and timely completion of studies, a comprehensive Course Catalogue 2021 with streamlined academic curricula has been produced. The document consists of standardized course descriptions of each course along with details of all programs offered in each discipline. This standardization would enhance, strengthen and consolidate the standard of education across all SZABIST campuses and bring it at par with national and international universities.

This Catalogue is one more indicator of SZABIST's growth into a mature institution, as it now offers thirty-five diversified programs in Management Sciences, Computing, Social Sciences, Media Sciences, Mechatronics Engineering, Life Sciences, Education, Public Health and its International Programs including LLB (University of London, UK) and BA (Hons.) in Business Studies and certificate of Higher education in comman law (University of London - Diploma) which has a continuing collaboration with universities in UK.

I thank the staff members of Institutional Research Department, in particular Ms. Mahwash Imran for collaborating with the Program Managers to prepare this Catalogue and the Marketing Department, especially Mr. Syed Bashir Ahmad, for his work in the design of the Catalogue.

I wish you a productive, intellectually stimulating, and socially responsible journey at SZABIST.

Best of luck!

Ms. Shahnaz Wazir Ali
President,
SZABIST

Message by the Vice President (Academics)

Congratulations on becoming a part of SZABIST family! The institution relishes a high reputation thorough the courtesy of its professional environment and dedication for imparting quality education. The institution has crossed 22 plus years of its existence. Its exponential growth speaks itself of its popularity. It is fully recognized by all the national regulatory bodies, such as HEC, PEC, NCEAC, NBEAC, NACTE, CIEC (Sindh). In addition, SZABIST is a member of several international associations, such as International Association of Universities (IAU) Paris, Association of Commonwealth Universities (ACU) London, Association of Advance Collegiate School of Business (AACSB) Singapore, Asia University Federation Seoul, Asia-Pacific Quality Network (APQN) China, Association of Quality Assurance Agencies of the Islamic World (AQAAIW) Malaysia, Tallories Network Massachusetts, etc.

The institution prepares students in diversified areas of learning, such as Management Sciences, Computer Science, Media Sciences, Life Sciences, Social Sciences, Mechatronic Engineering, Law, Public Health and Education. Through the meticulous program and course learning outcomes students' develop critical and creative thinking, and acquire problem-solving skills. We understand, "University without Research" is tantamount to "Body without Soul." That is why we give high priority to research seminars and encourage our students to write research articles at every stage.

Counseling and providing guidance to youngsters holds great significance, therefore, SZABIST provides its students a point of reference at every step during their course of studies and beyond. Some of the most important guiding steps are: Program Managers, Prospectus, Students Handbook, Course Catalogue, Executive Development Centre (EDC), External Relation and Financial Assistance (ERFA) and the like.

The Course Catalogue 2021 is prepared and shared to increase students' awareness on SZABIST's offering. The catalogue is a continuous point of reference for students as it consists of detailed and standardized descriptions of core courses being offered at SZABIST along with the range of elective courses and degree completion requirements. Further, EDC looks after the job placements and builds linkages with alumni. That's why our alumni are our face value.

Our strength is our ERP, developed by our own software house. We fully make use of modern IT tools in teaching and managing our academics and ensure quality education through ongoing and systematic assessments throughout the semesters. Our QEC has been awarded 93.59% score by QAA/HEC 2021.

Finally, we believe in building personalities, not merely producing degree-holders. This we ensure through conducting seminars and guest lectures frequently by eminent personalities, through our students' societies, which are responsible to arrange co-curricular and extra-curricular activities round the year.

Please go through the Course Catalogue 2021 to understand all the required offerings of your respective program. I assure you that you will be groomed and nurtured for meeting your future career challenges after completion of your academic degree program.

Professor Dr. M. Altaf Mukati
Vice President (Academics)
SZABIST

Message by the Vice President (Development & Finance)

Welcome to SZABIST and congratulations on being selected at one of the top ranked higher education institutes of Pakistan.

The Course Catalogue 2021 is a compendium of the courses being offered at SZABIST. I am confident that it will serve as a useful resource to broaden your knowledge and develop deeper understanding of the courses taught by our renowned faculty.

At SZABIST, we provide you the skils, ethical values and facilities to make you highly valued professionals.

Focus on your goals and study hard to reach where you want to be.

Best wishes for a successful year!

Ms. Nasreen Haque
Vice President (Development & Finance)
SZABIST

Preface

The Course Catalogue provides a platform for the students of SZABIST to avail in advance information relevant to their respective program course requirements.

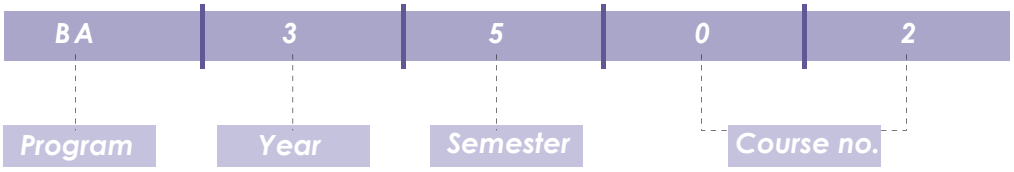
This Catalogue covers the core and/or compulsory courses for all the programs, offered in the following seven faculties:

- **Management Sciences**
- **Computer Sciences**
- **Social Sciences**
- **Media Sciences**
- **Mechatronics Engineering**
- **Life Sciences**
- **Education**
- **External Programs**

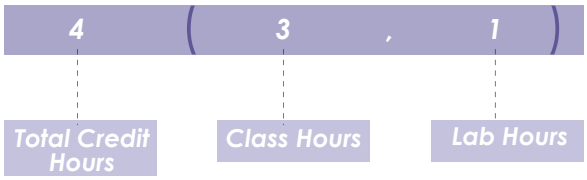
It provides information on the course credits, prerequisites (if any), course descriptions, and finally the equivalent courses. The students should consult the catalogue before registering for courses on ZabDesk.

Regardless of the academic program, this Catalogue will serve as a guidebook for students throughout their educational term at SZABIST. With the course descriptions, course titles and prerequisites mentioned, the student would easily be able to plan their semesters beforehand.

The courses in each program have been identified by their respective course codes. Therefore, the following course code illustration would assist the students in identifying the courses for a particular semester.



In addition, the composition of the Course Credit Hours is as follows:



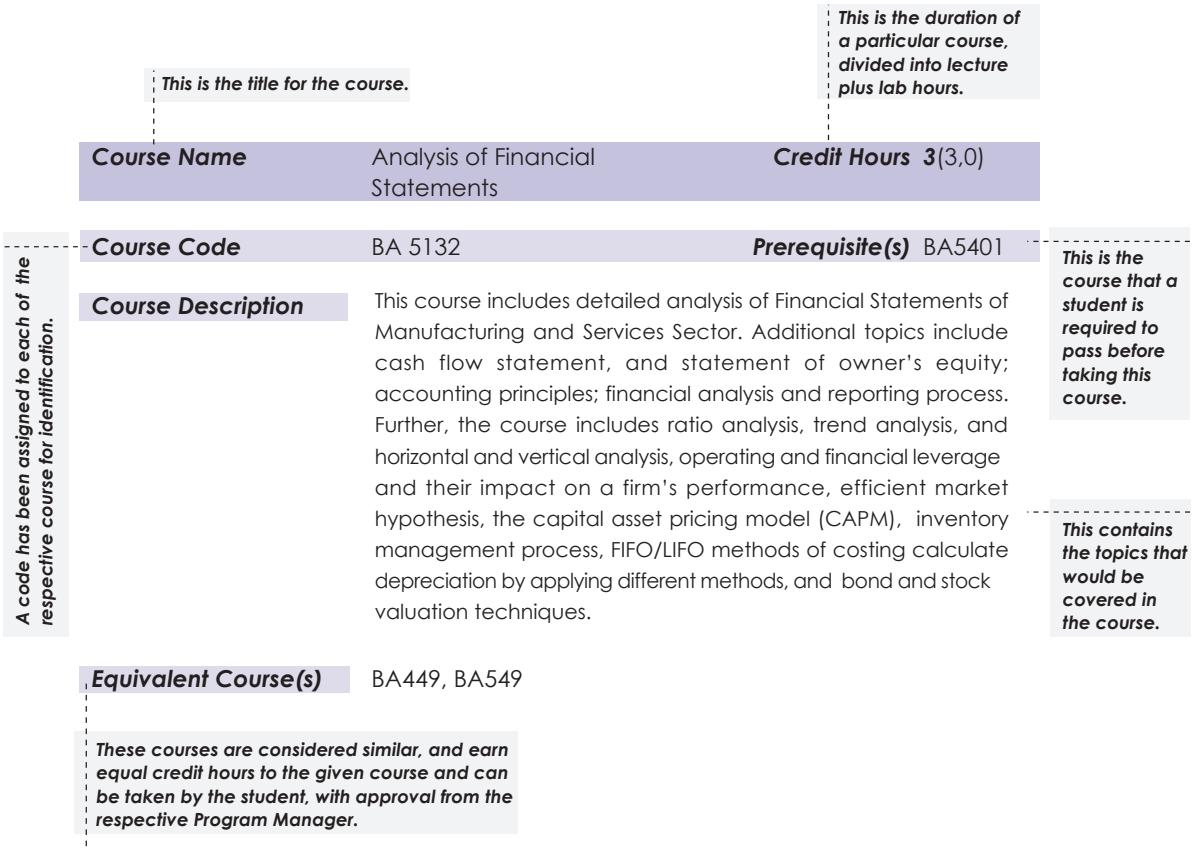
Please note that in case of Law Program and a few courses in other programs, identification of courses for a particular semester by their codes may not apply.

Acronyms

BA	***Business Administration***
BABS	***Bachelor of Arts in Business Administration***
BBA	***Bachelor of Business Administration***
B&F	***Banking & Finance***
BMS	***Bachelor of Media Science***
BS A&F	***Bachelor of Science in Accounting & Finance***
BS (Bioscience)	***Bachelor of Science in Biosciences***
BSAI	***Bachelor of Science in Artificial Intelligence***
BSCS	***Bachelor of Science in Computer Science***
BS (Entrepreneurship)	***Bachelor of Science in Entrepreneurship***
BSSS	***Bachelor of Science in Social Sciences***
EMBA	***Executive Master of Business Administration***
HEC	***Higher Education Commission of Pakistan***
IR	***Institutional Research***
IT	***Information Technology***
MA EDU	***Master of Arts in Education***
MBA	***Master of Business Administration***
ME	***Mechatronics Engineering***
MPH	***Master of Public Health***
MPM	***Master in Project Management***
MS	***Master of Science***
MS (Bioscience)	***Master of Science in Biosciences***
MSCS	***Master of Science in Computer Science***
MSELM	***Master of Science in Educational Leadership and Management***
MS (Media Studies)	***Master of Science in Media Studies***
MS (Data Sciences)	***Master of Science in Data Sciences***
MSMS	***Master of Science in Management Sciences***
MSPM	***Master of Science in Project Management***
MSSS	***Master of Science in Social Science***
PhD	***Doctor of Philosophy***
SE	***Software Engineering***
SS	***Social Science***

Schematic Illustration

Given below is an explanation of the various elements of the course catalogue.




Department of
Management
Sciences

1.1 Bachelor

1.1.1 Bachelor of Business Administration (BBA)

Students enrolled in the Bachelor of Business Administration (BBA) program are required to complete 46 courses with a 03 credit hour Business Project and a 03 credit hour Community Service Project within six (6) years. The break-up of 46 courses (144 credit hours) is as follows:

- *40 Compulsory Courses (120 Credit Hours)*
- *2 University Elective[01] Courses (6 Credit Hours)*
- *4 Elective[02] Courses (12 Credit Hours)*
- *1 Business Project (3 Credit Hours)*
- *1 Community Service Project (3 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
BA 1108	IT in Business	04
BA 1109	Personal Management and Communication	04
BA 1113	Islamic Studies/ Humanities	04
BA 1203	Management Principles	05
BA 1206	Oral Communication and Presentation Skills	05
BA 2307	Sociology	05
	Spring Semester	
BA 1101	Introduction to Accounting	05
BA 1102	Microeconomics	06
BA 1105	English Writing Skills	06
BA 1204	Maths for Business	06
BA 1213	Pakistan Studies	07
BA 2312	Human Behavior	07
	Second Year	
	Fall Semester	
BA 1201	Financial Accounting	07
BA 1202	Macroeconomics	07
BA 1211	Logic and Critical Thinking	08
BA 2303	Marketing Principles	08
BA 2406	Business and Electronic Communication	08
BA 3504	Organizational Behavior	08
	Spring Semester	
BA 2301	Introduction to Business Finance	09
BA 2311	Business Statistics	09
BA 2402	Retail Management	09
BA 2403	Business Ethics	09
BA 2411	Cost and Management Accounting	10
BA 3507	Consumer Behavior	10

01- List of University Elective Courses is given in Annexure A.
02- List of Electives is given in Annexure B.

1.1 Bachelor of Business Administration (BBA)

Course Code	Course Title	Page #
	Third Year	
	Fall Semester	
BA 3501	Financial Markets and Institutions	10
BA 3508	Media Management	11
BA 3605	Statistical Inference	11
BA 4706	Development Economics	11
BA 4801	Law and Taxation	12
BA xxxx	University Elective-I (as offered by Campus)	-
	Spring Semester	
BA 3601	Financial Management	12
BA 3602	Marketing Management	12
BA 3603	Business Research Methods	13
BA 3607	Operations Management	13
BA 4804	Human Resource Management	13
BA xxxx	University Elective-II (as offered by Campus)	-
	Fourth Year	
	Fall Semester	
BA 3502	Entrepreneurship	14
BA 4705	Services Marketing	14
BA 4710	Business Project	14
BA 4814	Project Management	14
BA 4xxx	Elective-I	-
BA 4xxx	Elective-II	-
	Spring Semester	
BA 3505	Quantitative Skills	15
BA 3609	Pakistan Economy	15
BA 4704	Management Information Systems	15
BA 4810	Community Service Project	15
BA 4xxx	Elective-III	-
BA 4xxx	Elective-IV	-

All courses may not be offered every year. Alternate courses may be substituted as and when required.

Compulsory Courses

The descriptions of 40 compulsory courses, required for the BBA degree are given below:

Course Name	IT in Business	**Credit Hours**	**3** (3,0)
Course Code	BA 1108	**Prerequisite(s)**	None

Course Description

Microsoft Office is critical for day-to-day operations of any organization. This course covers basic, intermediate, and advanced level of Office software that make a manager's task more productive and efficient. Today, employers across many industries and fields expect candidates to have Microsoft Office skills, as it is the most universally utilized software in business. Having these skills, even at a basic level, will help students' prospects and increase their chances to be considered for most roles.

Equivalent Course(s) BA 1103, AF 1102, EN 1102

Course Name	Personal Management and Communication	**Credit Hours**	**3** (3,0)
Course Code	BA 1109	**Prerequisite(s)**	None

Course Description

This course teaches students to discover themselves and make positive changes to achieve greater effectiveness at work, and in personal and interpersonal relationship. Students learn the combination of factors such as personality, communication style, self-esteem, time management, conflict, negotiation and others that impact their personal effectiveness. They also learn methods, and techniques required to work effectively and confidently with others, using time management, negotiation and presentation skills with a positive mindset.

Equivalent Course(s) BA 1104, EN 1206

Course Name	Islamic Studies	**Credit Hours**	**3** (3,0)
Course Code	BA 1113	**Prerequisite(s)**	None

Course Description

This course introduces the basic philosophy and universal teachings in private and social life. It also introduces the distinct Islamic values and institutions, and their role in society. The course informs about Islamic environmental values and ethics, and social systems. Furthermore, this course explains the fundamental principles of Islamic economic framework along-with contemporary Islamic financial and social institutions, and their role in the contemporary economy and financial systems. It clarifies the Islamic attitude towards science, reasoning, evidence and inductive knowledge for understanding physical realities for the effective use of material resources. Finally this course emphasizes social rights given to women, non-Muslims, orphans, parents and subordinates in the Islamic social framework.

Equivalent Course(s) AF 1205, EN 1207

Course Name	Management Principles	**Credit Hours**	**3** (3,0)
Course Code	BA 1203	**Prerequisite(s)**	None

Course Description

This course introduces the basic concepts of management, evolution and emergence of management thought, management function, planning concepts, decision-making, organizing, staffing, leading, controlling, and future of management and society.

Equivalent Course(s) AF 1207, EN 1204, BA 5419

Course Name	Oral Communication and Presentation Skills	**Credit Hours**	**3** (3,0)
Course Code	BA 1206	**Prerequisite(s)**	None

Course Description

In this course student' learns the principles of a good presentation and has the opportunity to practice and experience these principles during this highly participative course. The course explores in detail, both verbal and non-verbal communication characteristics, and the importance of body-language expressions. Students are challenged through participative exercises with focus on active listening and observation techniques, that aim to make them competent in all facets of effective speech communication.

Equivalent Course(s) CSC 2101, ME 1101, AF 1203, SS 1116

Course Name	Sociology	**Credit Hours**	**3** (3,0)
Course Code	BA 2307	**Prerequisite(s)**	None

Course Description

This course focuses on three central themes; social change, social inequality, and social harmony versus conflict. It combines selective theoretical texts with case studies to understand the mechanisms and institutions that can trigger, foster, sustain, or undermine each of the three processes. In addition, the course covers the work of major sociological thinkers and the influence of sociology on modernization, race, citizenship, culture, gender, society, and economic development.

Equivalent Course(s) BA 2306, SS 2307, AF 2304, EN 1203

Course Name	Introduction to Accounting	**Credit Hours**	**3** (3,0)
Course Code	BA 1101	**Prerequisite(s)**	None

Course Description

This course covers the purpose and nature of accounting, forms of business enterprises, accounting information users, Generally Accepted Accounting Principles, accounting equation, accounting process, accounting cycle, ledgers and entries, accounting for receivables, inventory and depreciation.

Equivalent Course(s) AF 1104, EN 1103

Course Name	English Writing Skills	**Credit Hours**	**3** (3,0)
Course Code	BA 1105	**Prerequisite(s)**	BA 1206

Course Description

This course covers comprehending problems and statements, developing arguments, and communicating ideas clearly and concisely. It also focuses on grammar, forms of punctuation, forms of speech, sentence and paragraph construction, composition, comprehension, writing styles, presentations, verbal communication skills, formal and informal presentations, interactive discussions, and role-playing.

Equivalent Course(s)

CSC 1102, MD 1122, SS 2316, BIO 1111, AF 1103

Course Name	Microeconomics	**Credit Hours**	**3** (3,0)
Course Code	BA 1102	**Prerequisite(s)**	None

Course Description

Microeconomics studies how the individual parts of the economy, the households and the firms, make decisions to allocate limited resources. This course is based on a comprehensive study of the market structures, product markets and resource markets. It also deals with application of demand and supply, cost analysis and factors of production.

Equivalent Course(s)

SS 1105, AF 2405, EN 1205, BA 5404

Course Name	Maths for Business	**Credit Hours**	**3** (3,0)
Course Code	BA 1204	**Prerequisite(s)**	None

Course Description

The aim of this course is to prepare students to solve economic and managerial problem through mathematical concepts. This course is covered in four parts, first part is based on systems of linear equations and its solutions; provide preliminary concept, construction of linear equations, graphical interpretation of data, systems of linear equations and solutions, introduction to matrix algebra, determinants, Cramer's rule & inverse method to solve system of linear equations. The second part develops the concept of linear and nonlinear functions, and their application, and linear programming. The third part provides mathematics for finance, which covers simple, and compound interest rate computations and present and future annuity calculations. The last part of the course provides differentiation of basic functions, higher order differentiation, optimization of functions, definite and indefinite integration, and applications of integration.

Equivalent Course(s)

BIO 1107, AF 1101, EN 1101

Course Name	Pakistan Studies	**Credit Hours**	**3** (3,0)
Course Code	BA 1213	**Prerequisite(s)**	None

Course Description

This course reviews the ideological and historic background for creation of Pakistan. It reviews the basic philosophy and circumstances that led to the creation of Pakistan. The course covers political and constitutional history of Pakistan, and discusses the current issues with respect to state, institutions and nation faced by Pakistan. Furthermore, the course looks at the role of Pakistan in the world over time and the future prospects.

Equivalent Course(s) EN 1107, AF 1105

Course Name	Human Behavior	**Credit Hours**	**3** (3,0)
Course Code	BA 2312	**Prerequisite(s)**	None

Course Description

This course covers the basics of psychological features of human behavior with applications in real life situations. In addition, the aspects of personal growth and understanding are also covered.

Equivalent Course(s) SS 2306, AF 2303, EN1104

Course Name	Financial Accounting	**Credit Hours**	**3** (3,0)
Course Code	BA 1201	**Prerequisite(s)**	BA 1101

Course Description

This course includes accounting for merchandise business, classified balance sheet, simple and multiple income statement, design of accounting system, accounts receivable, notes receivable, inventories, cost of goods sold, liabilities, corporation and measuring cash flow statements. Also, MS Excel is used and necessary accounting software is introduced.

Equivalent Course(s) AF 1201

Course Name	Macroeconomics	**Credit Hours**	**3** (3,0)
Course Code	BA 1202	**Prerequisite(s)**	BA 1102

Course Description

This course introduces key economic indicators, role of government in an economy, measurement of gross domestic product, components of aggregate demand, consumption function and Keynesian multiplier, investment function, government intervention through monetary and fiscal policies, impact of government intervention on economic activity, inflation and unemployment, aggregate supply and demand, balance of payments and trade, public finance, growth, and development.

Equivalent Course(s) SS 1205, AF 3505, EN 2303, BA 5402

Course Name	Logic and Critical Thinking	**Credit Hours**	**3** (3,0)
Course Code	BA 1211	**Prerequisite(s)**	BA 1105

Course Description

This course covers scope and laws of logic, deduction and induction, inferences, forms of discourse, emotive words, kinds of disputes and disagreements, rules and fallacies, classical (Aristotelian) logic, standard-form categorical syllogisms and testing, uniform translation, dilemma and enthymemes, and Mills' Methods of scientific investigation. Critical thinking skills and techniques are also introduced.

Equivalent Course(s) EN 2302, BA 1207

Course Name	Marketing Principles	**Credit Hours**	**3** (3,0)
Course Code	BA 2303	**Prerequisite(s)**	BA 1203

Course Description

This course introduces the basic concepts of marketing, marketing environment, planning and research, market segmentation and targeting, consumer behavior, industrial marketing, product planning, product-mix, pricing, distribution, placement, promotional mix, and marketing in global scenarios.

Equivalent Course(s) BA 5404, AF 1206, EN 2305

Course Name	Business and Electronic Communication	**Credit Hours**	**3** (3,0)
Course Code	BA 2406	**Prerequisite(s)**	BA 1105

Course Description

This introductory course teaches students to communicate at both personal and professional levels. In addition, it develops competency in all forms of communication. Also, this course introduces communication theories and strategies for a variety of business situations. Using a developmental approach to business communication, the course examines methods for organizing ideas, analyzing data, addressing diverse concerns, presenting information, and developing a professional communication style.

Equivalent Course(s) BE 5104, BA 5418, AF 2301, EN 1202

Course Name	Organizational Behavior	**Credit Hours**	**3** (3,0)
Course Code	BA 3504	**Prerequisite(s)**	BA 2312

Course Description

This course covers the subject matter on three levels: individual, group and interpersonal, and organizational. At the individual level, the focus is to examine individual behavior and differences, learning, perception, personality, motivation, and stress. The group/ interpersonal level covers group and inter-group behavior, creativity, and team decision-making. It also includes power, conflict, leadership, and communication. At the organizational level, it reviews the basics of organizational culture, organizational change and development, structure, design, employment relationship, and career management.

Equivalent Course(s) AF 2305, EN 2306, SS 2414, BE 5206

Course Name	Introduction to Business Finance	**Credit Hours**	**3** (3,0)
Course Code	BA 2301	**Prerequisite(s)**	BA 1201

Course Description

This course covers the concepts of business environment, forms of business organization, overview of financial environment, cost markets, institutions and interest rates, analyses of financial statements, time value of money, sources of short-term and long-term finance, break even analysis, working capital management, valuation of financial securities (debt/equity) and introduction to capital budgeting.

Equivalent Course(s) BA 5401, AF 4703, EN 2301

Course Name	Business Statistics	**Credit Hours**	**3** (3,0)
Course Code	BA 2311	**Prerequisite(s)**	BA1204

Course Description

This basic course aims to enhance the capacity of the students to solve the research problems by focusing on four areas; introduction to statistics, types of data, frequency distribution, graphs and charts, measures of central tendency, and measures of dispersion; concept of curve fitting techniques, regression analysis, correlation analysis, time series analysis; and index numbers, counting techniques and MS Excel tools for statistics using add-on analysis tool pack.

Equivalent Course(s) BA 2305, BIO 1208, AF 2406, EN 2304, SS 2318

Course Name	Retail Management	**Credit Hours**	**3** (3,0)
Course Code	BA 2402	**Prerequisite(s)**	BA 2303

Course Description

This course addresses retail management at two levels: the macro-level (the role of the retailing in the business industry), and the micro-level (which focuses on the functionality of a retail business). The course provides a preview of quality management, resources management, business communication, retail marketing and advertising, consumer behavior, inventory management and accounting, and human resource management.

Equivalent Course(s) Marketing Elective

Course Name	Business Ethics	**Credit Hours**	**3** (3,0)
Course Code	BA 2403	**Prerequisite(s)**	BA 1203

Course Description

This course introduces contemporary and controversial ethical issues faced by the business community. Topics include moral reasoning, moral dilemmas, law and morality, equity, justice and fairness, ethical standards, and moral development. Upon completion, students would be able to demonstrate an understanding of their moral responsibilities and obligations as members of the workforce and society.

Equivalent Course(s) AF 3503, EN 2402

Course Name	Cost and Management Accounting	**Credit Hours**	**3** (3,0)
Course Code	BA 2411	**Prerequisite(s)**	BA 1201

Course Description

This course focuses on cost allocation, process costing systems and spoilage. Specific topics include relevancy of revenues and costs, cost allocation decisions (joint and byproducts), process costing systems, factory overhead applied, standard costing: setting of standards, analysis of variance and controlling, and costing material.

Equivalent Course(s) BA 5411, AF 2302

Course Name	Consumer Behavior	**Credit Hours**	**3** (3,0)
Course Code	BA 3507	**Prerequisite(s)**	BA 2303

Course Description

This course examines in detail, the complex behavioral processes which determine consumer actions and analyzes the decision patterns in a variety of situations with a special reference to individual and group influences. It is designed to cover contemporary concepts in consumer behavior, objectives, consumer and market segmentation, environmental influence, individual determinants, and consumer buying behavior.

Equivalent Course(s) BE 484, EN 2403

Course Name	Financial Markets and Institutions	**Credit Hours**	**3** (3,0)
Course Code	BA 3501	**Prerequisite(s)**	BA 1202

Course Description

This course would equip students with the knowledge of the financial system, regulatory frameworks and financial and economic environments in Pakistan and other countries. The course essentially delves into the following key topics: financial markets encompassing both money and capital markets of Pakistan, monetary policies which are aligned in accordance to the monetary systems, responsibilities of SBP as central bank and comparison with different Central Bank structures in the world, controlling money supply in the economy, operations and functions of commercial and corporate banks, role of other financial intermediaries and key financial instruments available in the market. In addition, stocks, bonds, foreign exchange, derivatives, commodity markets and hedging instruments would also be discussed. A comparative analysis of financial markets and institutions, their functions, roles and impact on economic system shall be critically examined. The course is also intended to identify the regulatory compliance initiatives to ethical and prudential issues.

Equivalent Course(s) None

Course Name	Media Management	**Credit Hours**	**3** (3,0)
Course Code	BA 3508	**Prerequisite(s)**	BA 2303

Course Description

This course introduces basic concepts of public relations and how it is different from promotional tools. It discusses various public relations tools, dimensions, and disciplines. It also addresses issues emerging out of modern and emerging communication media and provides a broader perspective of media in Pakistan describing its characteristics and effective ways to interact with them. The course concludes with a brief discussion on event management with an overview of importance of communications during crisis situations.

Equivalent Course(s) EN 2405

Course Name	Statistical Inference	**Credit Hours**	**3** (3,0)
Course Code	BA 3605	**Prerequisite(s)**	BA 2311

Course Description

This course covers probability; probability distributions; Binomial, Poisson, Hyper-geometric, Chi Square distribution, Normal distribution, Sampling Distribution; estimation; hypothesis testing; one-population test, two-populations test and analysis of variance; and computer applications in statistics.

Equivalent Course(s) SS 2418, AF 3506, BA 5405

Course Name	Development Economics	**Credit Hours**	**3** (3,0)
Course Code	BA 4706	**Prerequisite(s)**	BA 1202

Course Description

This course defines development and identifies contemporary issues in development. It also discusses the theories of development, and relates them to the Pakistani scenario and the role of the international community in the development process. In addition, it also identifies and analyzes the problems of the poor in Pakistan, in particular, and of the developing countries, in general, it helps students to critically analyze contemporary domestic and international economic policies and determine whether such policies improve or worsen the condition of the poor.

Equivalent Course(s) SS 1163, SS 4147, SS 4284

Course Name	Law and Taxation	**Credit Hours**	**3** (3,0)
Course Code	BA 4801	**Prerequisite(s)**	BA 1211

Course Description

This course covers process of legislation in Pakistan, Contract Act, Law of Sale of Goods, Partnership Law and Company laws, Sales Tax, Income Tax Law and Intellectual Property Laws. This course identifies the legal rights of persons in case of nonperformance of contracts, it also identifies the taxation system as well as kinds of taxes in Pakistan. Furthermore, it identifies the intellectual property rights in Pakistan.

Equivalent Course(s) AF 3606, EN 2401

Course Name	Financial Management	**Credit Hours**	**3** (3,0)
Course Code	BA 3601	**Prerequisite(s)**	BA 2301

Course Description

Building upon the concepts already laid down in its pre-requisite, financial management helps students in exploring the depths of the relatively complex aspects of the financial world, with prime focus on the present value and opportunity cost of capital. This course covers topics such as nature, scope and function of financial decision areas, objectives of financial management, financial forecasting, working capital management, valuation of stocks, valuation of fixed income securities, project cash flow analysis, capital budgeting and decision making, determination of the required rate of return via asset pricing models, dividend policy, debt policy, introduction to financial risk management and derivatives and role of financial markets in Pakistan.

Equivalent Course(s) BA 5105, AF 4702, BE 5301

Course Name	Marketing Management	**Credit Hours**	**3** (3,0)
Course Code	BA 3602	**Prerequisite(s)**	BA 2303

Course Description

This course introduces the concept of customer and market-driven management. Also, this course covers organizations' external and internal environment, strengths, weaknesses, opportunities and threats, marketing information system, buyer behavior analysis, segmenting, targeting and positioning strategies, product and pricing strategies, an in-depth study of strategy building by organizations with the help of case studies and a practical, hands-on learning experience of marketing management through close observations of marketing management at different levels in marketing channels.

Equivalent Course(s) BA 5106, AF 2403, BE 5205

Course Name	Business Research Methods	**Credit Hours**	**3** (3,0)
Course Code	BA 3603	**Prerequisite(s)**	BA 3605

Course Description

This course provides the understanding of basic business research methods in the field of marketing, human resource management, and finance. The subject encompasses the theory and practice of research; and covers concepts, elements, and process of conducting business research. It builds the specific conceptual knowledge regarding identification and elicitation of research problem, development of research proposal, reviewing the literature, using suitable research methodology, data collection and analysis tools and writing research report. The focus of the course is on basic concept building and relating the research to real life business problems.

Equivalent Course(s) SS 3504, AF 3609

Course Name	Operations Management	**Credit Hours**	**3** (3,0)
Course Code	BA 3607	**Prerequisite(s)**	BA 1203

Course Description

This course introduces the concepts of production and operations management. Topics covered represent a blend of concepts from industrial engineering, cost accounting, general management, quantitative methods, and statistics. The course topics include some operations and strategic issues such as applied forecasting, aggregate planning, scheduling, shop floor control, total quality management, inventory management, and facility layout and project management. In addition, topics include the complex understanding of services operations management with the help of real-life case studies, processes and methodologies applied worldwide.

Equivalent Course(s) EN 2406, BA 4128, BE 5303

Course Name	Human Resource Management	**Credit Hours**	**3** (3,0)
Course Code	BA 4804	**Prerequisite(s)**	BA 3504

Course Description

This course examines the role of the human resource professional, as a strategic partner, in managing contemporary organizations. The course introduces concepts, issues and practices in human resource management such as Human Resource planning, job design and analysis, recruitment and selection, training and development, performance appraisal, compensation and benefit management, career planning and development, employee relations, appraising the implications of legal and global environments and analyzing the current issues (such as diversity training, sexual harassment policies, and rising benefit costs), and best practices of employers of choice.

Equivalent Course(s) BA 5205, AF 1204, EN 3602, BE 5302

Course Name	Entrepreneurship	**Credit Hours**	**3** (3,0)
Course Code	BA 3502	**Prerequisite(s)**	BA 1203

Course Description

This course focuses on ways in which entrepreneurs recognize opportunities, generate ideas, and organize resources to plan and run successful ventures that enable them to achieve their goals. Students are required to create an entrepreneurial venture as part of a practical learning activity. Through this hands-on experience, case studies, class discussions and text book readings students will have an opportunity to develop the values, traits, and skills most often associated with successful entrepreneurs.

Equivalent Course(s)

BA 4859, BA 3517, AF 3504, EN 2404, BE 5401

Course Name	Services Marketing	**Credit Hours**	**3** (3,0)
Course Code	BA 4705	**Prerequisite(s)**	BA 3602

Course Description

In this course students studies the difference between marketing mix of tangible offerings and that of services; describing applications of services marketing; developing services marketing plan and practice services marketing and developing entrepreneurial mindset in a service industry. The course focuses on marketing services through 7Ps, whether service is the primary business or a supplementary to a product.

Equivalent Course(s)

Marketing Elective

Course Name	Business Project	**Credit Hours**	**3** (3,0)
Course Code	BA 4710	**Prerequisite(s)**	BA 3603

Course Description

In Business Project, students are required to work in teams on a capstone project, which is formally issued by a company or industry, on a specific opportunity or challenge faced by that company/ industry. The project work usually involves carrying out research and/or performing analysis for proposing solutions to the issue.

Equivalent Course(s)

None

Course Name	Project Management	**Credit Hours**	**3** (3,0)
Course Code	BA 4814	**Prerequisite(s)**	BA 3607

Course Description

This course is split into three parts: Project Initiation, Project Implementation, and Project Termination. Topics include: definition of a project, importance of project management, project life cycle, types of projects, project management and related industries, project initiation and selection, project manager, project organization, project planning, conflicts and negotiation, project implementation, budgeting and cost estimation, scheduling, resource allocation, monitoring and information systems, project control, project termination, and project auditing. Furthermore, the course covers project feasibility study, format of feasibility study, contents of feasibility study, and making accurate estimates.

Equivalent Course(s)

None

Course Name	Quantitative Skills	**Credit Hours**	**3** (3,0)
Course Code	BA 3505	**Prerequisite(s)**	BA 1204

Course Description

This course is an introduction to quantitative skills essentially required by business students. The course consists of several parts. First is related to arithmetic techniques like: numbers, exponents and roots, ratio and proportion, averages etc. and their usage in solving common problems. The second part consists of algebra, equations, and their applications in solving business problems. The third part comprises of coordinate geometry and combination of above parts. The fourth part covers graphical analysis and interpretation of the data. The fifth and last part consists of data sufficiency problems related to arithmetic, algebra and geometry.

Equivalent Course(s) None

Course Name	Pakistan Economy	**Credit Hours**	**3** (3,0)
Course Code	BA 3609	**Prerequisite(s)**	BA 4706

Course Description

This course is designed to provide students critical information and knowledge about Pakistan economic environment. Starting with the historical background, it covers topics such as agriculture, industry, public finance and social sector development. The course also reviews government interventions, like fiscal policy, monetary policy, trade policy, and income policies. Further, the additional topics of this course includes institutional reforms, deregulation, privatization, denationalization, globalization and other policies/factors that affect business environment in Pakistan. The course ends with discussion on challenges ahead for the Pakistan Economy in the regional and global perspectives.

Equivalent Course(s) SS 4249, AF 2306, EN 4701

Course Name	Management Information Systems	**Credit Hours**	**3** (3,0)
Course Code	BA 4704	**Prerequisite(s)**	BA 1108

Course Description

This course covers different information technology applications in business for efficient management of business operations by providing support to decision makers for strategic business decisions. The course examines various corporate frameworks for information management and their utility.

Equivalent Course(s) AF 2402

Course Name	Community Service Project	**Credit Hours**	**3** (3,0)
Course Code	BA 4804	**Prerequisite(s)**	BA 2307, BA2403

Course Description

In Community Service Project, students are required to work in teams on a formally issued project for serving the community by a not-for-profit organization. The project work usually involves carrying out research for, and/or, completing a community-based project, for the partner organization. Post-project evaluation is done by the project supervisor and the partner organization, and followed by an impact assessment of the project.

Equivalent Course(s) AF 2402

1.1.1 Bachelor of Arts in Business Studies (BABS)

SZABIST offers a 3-year BA (Hons) degree in Business Studies from Coventry University, UK. Students who complete two years at SZABIST will proceed ahead to complete the third year from Coventry University, UK and earn an International degree.
Students can also complete the BABS degree at SZABIST by opting for the 3rd and 4th year of BABS program. BABS is a General Management Degree. The maximum duration to complete this degree is six years

- *44 Compulsory Courses (138 Credit Hours)*
- *2 University Electives[03]*
- *1 Research Project (6 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
BA 1101	Introduction to Accounting	18
BA 1102	Microeconomics	18
BA 1103	Introduction to Computers	18
BA 1104	Personal Management	18
BA 1206	Oral Communication and Presentation Skills	19
BA 1204	Math for Business	19
	Spring Semester	
BA 1201	Financial Accounting	19
BA 1202	Macroeconomics	20
BA 1203	Management Principles	20
BA 1105	English Writing Skills	20
BA 2305	Statistics and Mathematics for Business	20
BA 2312	Human Behavior	21
	Summer Semester	
BA 2301	Introduction to Business Finance	21
BA 2302	Graphic Design in Multimedia Presentations	21
	Second Year	
	Fall Semester	
BA 2303	Marketing Principles	21
BA 2304	Managerial Accounting	22
BA 2315	Introduction to Social Sciences	22
BA 2403	Business Ethics	22
BA 3504	Organizational Behavior	22
BA 1207	Introduction to Logic	23
	Spring Semester	
BA 3505	Quantitative Skills	23
BA 3601	Financial Management	23
BA 3602	Marketing Management	24
BA 4704	Management Information Systems	24
BA 4721	Advertising	24
BA 4801	Law and Taxation	24

03- List of Electives is given in Annexure B.

1.1.2 Bachelor of Arts in Business Studies (BABS)

Course Code	Course Title	Page #
	Third Year	
	Fall Semester	
BA 1113	Islamic Studies	25
BA 4804	Human Resource Management	25
BA 2406	Business and Electronic Communication	25
BA 3517	Entrepreneurship & Small Business Management	26
BA 3518	Law for Managers	26
BA 3605	Statistical Inference	26
	Spring Semester	
BA 3617	Introductions to International Business	26
BA 1213	Pakistan Studies	27
BA 3616	Customer Relationship Management	27
BA 3618	Leadership Development	27
BA xxxx	University Elective-I	-
	Fourth Year	
	Fall Semester	
BA 3507	Consumer Behavior	28
BA 3501	Financial Markets and Institutions	28
BA 4824	Sales & Retail Management	28
BA 3603	Business Research Methods	29
BA 4703	Staffing/Compensation and Employee development	29
	Spring Semester	
BA 4807	Research Project	29
BA 4814	Project Management	30
BA 4128	Operations & Supply Chain Management	30
BA 4127	Managing Across Global environment	30
BA xxxx	University Elective-II	-

All courses may not be offered every year. Alternate courses may be substituted as and when required.

1.1.2 Bachelor of Arts in Business Studies (BABS)

Compulsory Courses

All courses may not be offered every year. Alternate courses may be substituted as and when required. Alternate courses may be substituted as and when required. Full-time academic load is six courses (18 credit hours). All students are required to register for full load in the first semester.

Course Name	Introduction to Accounting	**Credit Hours**	**3** (3,0)
Course Code	BA 1101	**Prerequisite(s)**	None
Course Description	This course covers the purpose and nature of accounting, forms of business enterprises, accounting information users, generally accepted accounting principles, accounting equation, accounting process, the accounting cycle, ledgers and entries, accounting for receivables, inventory and depreciation.		
Equivalent Course(s)	AF 1104, EN 1103		

Course Name	Microeconomics	**Credit Hours**	**3** (3,0)
Course Code	BA 1102	**Prerequisite(s)**	None
Course Description	Microeconomics studies how the individual parts of the economy, the households and the firms, make decisions to allocate limited resources. This course is based on a comprehensive study of the market structures, product markets and resource markets. It also deals with application of demand and supply, cost analysis and factors of production.		
Equivalent Course(s)	SS 1105, AF 2405, EN 1205		

Course Name	Introduction to Computers	**Credit Hours**	**3** (1,2)
Course Code	BA 1103	**Prerequisite(s)**	None
Course Description	This course introduces fundamental computer concepts, including basic functions and operations of the computer. Course topics include; identification of hardware, operating system, application software, programming languages, files and data basics, data communication, networking basics, computer graphics, computer security and controls, MS Word, MS Excel, MS Access, MS Power Point, MS Project, internet browsers, databases and e-banking.		
Equivalent Course(s)	BA 1108, BIO 1104, AF 1102, EN 1102, CSC 1104		

Course Name	Personal Management	**Credit Hours**	**3** (3,0)
Course Code	BA 1104	**Prerequisite(s)**	None
Course Description	This course teaches students to discover themselves and make positive changes to achieve greater effectiveness at work, and in personal and interpersonal relationship. Students learn the combination of factors such as personality, communication style, self-esteem, time management, conflict, negotiation and others that impact their personal effectiveness. They also learn methods, and techniques required to work effectively and confidently with others, using time management, negotiation and presentation skills with a positive mindset.		
Equivalent Course(s)	BA 1109, EN 1206		

1.1.2 Bachelor of Arts in Business Studies (BABS)

Course Name	Oral Communication and Presentation Skills	**Credit Hours**	**3** (3,0)
Course Code	BA 1206	**Prerequisite(s)**	None

Course Description

In this course student' learns the principles of a good presentation and has the opportunity to practice and experience these principles during this highly participative course. The course explores in detail, both verbal and non-verbal communication characteristics, and the importance of body-language expressions. Students are challenged through participative exercises with focus on active listening and observation techniques, that aim to make them competent in all facets of effective speech communication.

Equivalent Course(s) CSC 2101, ME 1101, AF 1203, EN 1106, SS 1116

Course Name	Maths for Business	**Credit Hours**	**3** (3,0)
Course Code	BA 1204	**Prerequisite(s)**	None

Course Description

The aim of this course is to prepare students to solve economic and managerial problem through mathematical concepts. This course is covered in four parts, first part is based on systems of linear equations and its solutions provide preliminary concept, construction of linear equations, graphical interpretation of data, systems of linear equations and solutions, introduction to matrix algebra, determinants, Cramer's rule & inverse method to solve system of linear equations. The second part develops the concept of linear and nonlinear functions and their application, and linear programming. The third part provides mathematics for finance, which covers simple, and compound interest rate computations and present and future annuity calculations. The last part of the course provides differentiation of basic functions, higher order differentiation, optimization of functions, definite and indefinite integration, and applications of integration.

Equivalent Course(s) BIO 1107, AF 1102, EN 1101

Course Name	Financial Accounting	**Credit Hours**	**3** (3,0)
Course Code	BA 1201	**Prerequisite(s)**	BA 1101

Course Description

This course includes accounting for merchandise business, classified balance sheet, simple and multiple income statement, design of accounting system, accounts receivable, notes receivable, inventories, cost of goods sold, liabilities, corporation and measuring cash flow statements. Also, MS Excel is used and necessary accounting software is introduced.

Equivalent Course(s) AF 1201

1.1.2 Bachelor of Arts in Business Studies (BABS)

Course Name	Macroeconomics	**Credit Hours**	**3** (3,0)
Course Code	BA 1202	**Prerequisite(s)**	BA 1102
Course Description	This course introduces key economic indicators, role of government in an economy, measurement of gross domestic product, components of aggregate demand, consumption function and Keynesian multiplier, investment function, government intervention through monetary and fiscal policies, impact of government intervention on economic activity, inflation and unemployment, aggregate supply and demand, balance of payments and trade, public finance, growth, and development.		
Equivalent Course(s)	SS 1205, AF 3505, EN 2303		

Course Name	Management Principles	**Credit Hours**	**3** (3,0)
Course Code	BA 1203	**Prerequisite(s)**	None
Course Description	This course introduces the basic concepts of management, evolution and emergence of management thought, management function, planning concepts, decision-making, organizing, staffing, leading, controlling, and future of management and society.		
Equivalent Course(s)	AF 1106, EN 1204		

Course Name	English Writing Skills	**Credit Hours**	**3** (3,0)
Course Code	BA 1105	**Prerequisite(s)**	None
Course Description	This course covers comprehending problems and statements, developing arguments, and communicating ideas clearly and concisely. It also focuses on grammar, forms of punctuation, forms of speech, sentence and paragraph construction, composition, comprehension, writing styles, presentations, verbal communication skills, formal and informal presentations, interactive discussions, and role-playing.		
Equivalent Course(s)	CSC 1102, MD 1122, SS 2316, BIO 1111, AF 1103		

Course Name	Statistics and Mathematics for Business	**Credit Hours**	**3** (3,0)
Course Code	BA 2305	**Prerequisite(s)**	BA 1204
Course Description	The course covers descriptive statistical tools and mathematical methods. Statistical tools consist of: frequency distribution, graphs, charts, mean, and variance, percentiles, correlation, and regression analysis. Mathematical methods consist of matrices, system of linear equations, differentiation and optimization, linear programming, and simplex method. The topics are taught in relation to their application in business and economics.		
Equivalent Course(s)	BA 2311, BIO 1208, AF 2406, EN 2304, SS 2318		

1.1.2 Bachelor of Arts in Business Studies (BABS)

Course Name	Human Behavior	**Credit Hours**	**3** (3,0)
Course Code	BA 2312	**Prerequisite(s)**	None
Course Description	This course covers the basics of psychological features of human behavior with applications in real life situations. In addition, the aspects of personal growth and understanding are also covered.		
Equivalent Course(s)	BA 2306, SS 2306, AF 2303, EN1104		

Course Name	Introduction to Business Finance	**Credit Hours**	**3** (3,0)
Course Code	BA 2301	**Prerequisite(s)**	BA 1201
Course Description	This course covers the concepts of business environment, forms of business organization, overview of financial environment, cost markets, institutions and interest rates, analyses of financial statements, time value of money, sources of short-term and long-term finance, break even analysis, working capital management, valuation of financial securities (debt/equity) and introduction to capital budgeting.		
Equivalent Course(s)	BA 5401, AF 4703, EN 2301		

Course Name	Graphic Design in Multimedia Presentations	**Credit Hours**	**3** (1,2)
Course Code	BA 2302	**Prerequisite(s)**	BA 1103
Course Description	This course introduces the computer system developed for graphics. It covers topics such as hardware and software components for multimedia production, basic computer operations, ergonomics, file management, scanning techniques, archiving capabilities, and utilization of the multimedia department server and internet connection. Software such as Adobe Photoshop, and Freehand are introduced.		
Equivalent Course(s)	BA 4842		

Course Name	Marketing Principles	**Credit Hours**	**3** (3,0)
Course Code	BA 2303	**Prerequisite(s)**	BA 1203
Course Description	This course introduces the basic concepts of marketing, marketing environment, planning and research, market segmentation and targeting, consumer behavior, industrial marketing, product planning, product-mix, pricing, distribution, placement, promotional mix, and marketing in global scenarios.		
Equivalent Course(s)	BA 5404, AF 1206, EN 2305		

1.1.2 Bachelor of Arts in Business Studies (BABS)

Course Name	Managerial Accounting	**Credit Hours**	**3** (3,0)
Course Code	BA 2304	**Prerequisite(s)**	BA 1201
Course Description	This course focuses on cost allocation, process costing systems and spoilage. Specific topics include relevancy of revenues and costs, cost allocation decisions (joint and byproducts), process costing systems, Factory overhead applied, Standard Costing: Setting of Standards, Analysis of Variance and Controlling and Costing Material.		
Equivalent Course(s)	BA 2408, BA 5411, AF 2302		

Course Name	Introduction to Social Sciences	**Credit Hours**	**3** (3,0)
Course Code	BA 2315	**Prerequisite(s)**	None
Course Description	This is an interdisciplinary course combining the perspectives of two or more of the social and behavioral sciences (anthropology, economics, geography, history, political science, psychology and sociology) on the central issues in social science studies. This course explores the relationship between the social and behavioral sciences being studied. It reviews the application of the scientific method, compares theory and concepts, and reviews the different perspectives of the discipline being studied. This course is broad in nature and scope and provides the basis for further study in various social and behavioral sciences.		
Equivalent Course(s)	BA 2307, SS 2307, AF 2304, EN 1203		

Course Name	Business Ethics	**Credit Hours**	**3** (3,0)
Course Code	BA 2403	**Prerequisite(s)**	BA 1203
Course Description	This course introduces contemporary and controversial ethical issues faced by the business community. Topics include: moral reasoning, moral dilemmas, law and morality, equity, justice and fairness, ethical standards, and moral development. Upon completion, students would be able to demonstrate an understanding of their moral responsibilities and obligations as members of the workforce and society.		
Equivalent Course(s)	AF 3503, EN 2402		

Course Name	Organizational Behavior	**Credit Hours**	**3** (3,0)
Course Code	BA 3504	**Prerequisite(s)**	BA 2312
Course Description	This course covers the subject matter on three levels: individual, group and interpersonal, and organizational. At the individual level, the focus is to examine individual behavior and differences, learning, perception, personality, motivation, and stress. The group/ interpersonal level covers group and inter-group behavior, creativity, and team decision-making. It also includes power, conflict, leadership, and communication. At the organizational level, it reviews the basics of organizational culture, organizational change and development, structure, design, employment relationship, and career management.		
Equivalent Course(s)	BA 5207, AF 2305, EN 2306, SS 2414		

1.1.2 Bachelor of Arts in Business Studies (BABS)

Course Name	Introduction to Logic	**Credit Hours**	**3** (3,0)
Course Code	BA 1207	**Prerequisite(s)**	BA 1105

Course Description

This course covers scope and laws of logic, deduction and induction, inferences, forms of discourse, emotive words, kinds of disputes and disagreements, rules and fallacies, classical (Aristotelian) logic, standard-form categorical syllogisms and testing, uniform translation, dilemma and enthymemes, and Mills' Methods of scientific investigation. Critical thinking skills and techniques are also introduced.

Equivalent Course(s) BA 1211, EN 2302

Course Name	Quantitative Skills	**Credit Hours**	**3** (3,0)
Course Code	BA 3505	**Prerequisite(s)**	BA 2305

Course Description

This course is an introduction to quantitative skills essentially required to business students. The course consists of several parts. First is related to arithmetic techniques like: numbers, exponents and roots, ratio and proportion, averages etc. and their usage in solving common problems. The second part consists of algebra, equations, and their applications in solving business problems. The third part comprises of coordinate geometry and combination of above parts. The fourth part covers graphical analysis and interpretation of the data. The fifth and last part consists of data sufficiency problems related to arithmetic, algebra and geometry.

Equivalent Course(s) None

Course Name	Financial Management	**Credit Hours**	**3** (3,0)
Course Code	BA 3601	**Prerequisite(s)**	BA 2301

Course Description

Building upon the concepts already laid down in its pre-requisite, financial management helps students in exploring the depths of the relatively complex aspects of the financial world, with prime focus on the present value and opportunity cost of capital. This course covers topics such as nature, scope, and function of financial decision areas, objectives of financial management, financial forecasting; working capital management, valuation of stocks, valuation of fixed income securities, project cash flow analysis, capital budgeting and decision making, determination of the required rate of return via asset pricing models, dividend policy, debt policy, introduction to financial risk management, and derivatives and role of financial markets in Pakistan.

Equivalent Course(s) BA 5105, AF 4702

1.1.2 Bachelor of Arts in Business Studies (BABS)

Course Name	Marketing Management	**Credit Hours**	**3** (3,0)
Course Code	BA 3602	**Prerequisite(s)**	BA 2303

Course Description

This course introduces the concept of customer and market-driven management. In addition, this course covers organizations' external and internal environment, strengths, weaknesses, opportunities and threats, marketing information system, buyer behavior analysis, segmenting, targeting and positioning strategies, product and pricing strategies, an in-depth study of strategy building by organizations with the help of case studies and a practical, hands-on learning experience of marketing management through close observations of marketing management at different levels in marketing channels.

Equivalent Course(s) BA 5106, AF 2403

Course Name	Management Information Systems	**Credit Hours**	**3** (3,0)
Course Code	BA 4704	**Prerequisite(s)**	BA 1103

Course Description

This course covers different information technology applications in business for efficient management of business operations by providing support to decision makers for strategic business decisions. The course examines various corporate frameworks for information management and their utility.

Equivalent Course(s) AF 2402

Course Name	Advertising	**Credit Hours**	**3** (3,0)
Course Code	BA 4721	**Prerequisite(s)**	BA 2303

Course Description

This course introduces students to the principles and practices of contemporary advertising, marketing and public relations. In this course students explore these roles in the marketplace, the elements of a successful advertisement, advertising production, and tasks accomplished by media professionals while promoting products and service businesses.

Equivalent Course(s) None

Course Name	Law and Taxation	**Credit Hours**	**3** (3,0)
Course Code	BA 4801	**Prerequisite(s)**	BA 1211

Course Description

This course covers process of legislation in Pakistan, Contract Act, Law of Sale of Goods, Partnership Law and Company laws, Sales Tax, Income Tax Law and Intellectual Property Laws. This course identifies the legal rights of persons in case of nonperformance of contracts, it also identifies the taxation system as well as kinds of taxes in Pakistan. Furthermore, it also identifies the intellectual property rights in Pakistan.

Equivalent Course(s) AF 3606, EN 2401

Course Name	Islamic Studies	**Credit Hours**	**3** (3,0)
Course Code	BA 1113	**Prerequisite(s)**	None

Course Description

This course introduces the basic philosophy and universal teachings of Islam in private and social life. It also introduces the distinct Islamic values and institutions and their role in society. The course informs about Islamic environmental values and ethics, and social systems. Furthermore, this course explains the fundamental principles of Islamic economic framework along with contemporary Islamic financial and social institutions and their role in the contemporary economy and financial system. It clarifies the Islamic attitude towards science, reasoning, evidence and inductive knowledge for understanding physical realities for the effective use of material resources. Finally, this course emphasizes social rights given to women, non-Muslims, orphans, parents and subordinates in the Islamic social framework.

Equivalent Course(s) None

Course Name	Human Resource Management	**Credit Hours**	**3** (3,0)
Course Code	BA 4804	**Prerequisite(s)**	BA 3504

Course Description

This course examines the role of the human resource professional, as a strategic partner, in managing contemporary organizations. The course introduces concepts, issues and practices in human resource management such as human resource planning, job design and analysis, recruitment and selection, training and development, performance appraisal, compensation and benefit management, career planning and development, employee relations, appraising the implications of legal and global environments and analyzing the current issues (such as diversity training, sexual harassment policies, rising benefit costs), and best practices of employers of choice.

Equivalent Course(s) BA 5205, AF 4804, EN 3602

Course Name	Business and Electronic Communication	**Credit Hours**	**3** (3,0)
Course Code	BA 2406	**Prerequisite(s)**	BA 1105

Course Description

This introductory course teaches students to communicate at both personal and professional levels. In addition, it develops competency in all forms of communication. This course introduces communication theories and strategies for a variety of business situations. Using a developmental approach to business communication, the course examines methods for organizing ideas, analyzing data, addressing diverse concerns, presenting information, and developing a professional communication style.

Equivalent Course(s) BA 5418, AF 2301, EN 1202

1.1.2 Bachelor of Arts in Business Studies (BABS)

Course Name	Entrepreneurship & Small Business Management	**Credit Hours**	**3** (3,0)
Course Code	BA 3517	**Prerequisite(s)**	BA 2303
Course Description	This course focuses on ways in which entrepreneurs recognize opportunities, generate ideas, and organize resources to plan and run successful ventures that enable them to achieve their goals. Students are required to create an entrepreneurial venture as part of a practical learning activity. Through this hands-on experience, case studies, class discussions and textbook readings students will have an opportunity to develop the values, traits, and skills most often associated with successful entrepreneurs.		
Equivalent Course(s)	BA 4859, BA 3502, AF 3504, EN 2404		

Course Name	Law for Managers	**Credit Hours**	**3** (3,0)
Course Code	BA 3518	**Prerequisite(s)**	BA 4801
Course Description	This course focuses on ways to teach students the basic principles in governing the corporate laws, management and the structure of corporate entities. In addition, the students will be able to comprehend the corporate laws applicable to the listed and public sector companies. This course identifies the rules and regulations laid down by Competition Commission of Pakistan; and demonstrate the rules and regulations governing the Non-Banking Finance Corporations.		
Equivalent Course(s)	None		

Course Name	Statistical Inference	**Credit Hours**	**3** (3,0)
Course Code	BA 3605	**Prerequisite(s)**	BA 2311
Course Description	This course covers probability; probability distributions; Binomial, Poisson, Hyper-geometric, Chi Square distribution, Normal distribution, Sampling Distribution; estimation; hypothesis testing; one-population test, two-populations test and analysis of variance; and computer applications in statistics.		
Equivalent Course(s)	SS 2418, AF 3506		

Course Name	Introduction to International Business	**Credit Hours**	**3** (3,0)
Course Code	BA 3617	**Prerequisite(s)**	BA 3602, BA 4804 BA 2404, BA 3502
Course Description	This course provides the manager perspective in the fields of international payments, international trade, and the analysis of investments. Emphasis is given to the materials and concepts that illuminate the strategies, structure, practices, and effects of multinational enterprises. The topics to be covered are: The Nature of International Business Management, Marketing to Customers with Diverse Cultural Backgrounds, Operations in Diverse Political and Legal Environments, Finance in the International Marketplace, Human Resources and Employees of Diverse Cultural Backgrounds, and Strategy and Structure of International or Global Enterprises.		
Equivalent Course(s)	BA 5308		

1.1.2 Bachelor of Arts in Business Studies (BABS)

Course Name	Pakistan Studies	**Credit Hours**	**3** (3,0)
Course Code	BA 1213	**Prerequisite(s)**	None

Course Description

This course reviews the ideological and historic background for creation of Pakistan. It reviews the basic philosophy and circumstances that led to the creation of Pakistan. The course covers political and constitutional history of Pakistan, and discusses the current issues with respect to state, institutions and nation faced by Pakistan. Furthermore, the course looks at the role of Pakistan in the World over time, and the future prospects.

Equivalent Course(s) None

Course Name	Customer Relationship Management	**Credit Hours**	**3** (3,0)
Course Code	BA 3616	**Prerequisite(s)**	BA 2303

Course Description

Customer Relationship Management (CRM) is the business strategy, process, culture and technology that enables organizations to optimize revenue and increase value through a more complete understanding and fulfillment of customer needs. CRM aims at providing better customer service, retaining customers as long-term profitable customers, selling services/products more effectively, gaining new customers from present customers through referrals, and providing helping hand to salespeople.

Equivalent Course(s) BA 5124

Course Name	Leadership Development	**Credit Hours**	**3** (3,0)
Course Code	BA 3618	**Prerequisite(s)**	BA 4804

Course Description

This course is designed to build upon fundamental leadership theory and further explore historical and contemporary leadership theories, models and perspectives within a variety of contexts. Through dynamic interactions between the instructor, students and other experiences, each student should develop a more complete and holistic philosophical and theoretical leadership framework. This course focuses on professional leadership development. The course is designed to improve personal awareness in the areas of self-management, professionalism, work attitudes and motivation, personality, innovation and creativity, communication, diversity, and ethical decision making.

Equivalent Course(s) None

Course Name	Consumer Behavior	**Credit Hours**	**3** (3,0)
Course Code	BA 3507	**Prerequisite(s)**	BA 2303

Course Description

This course examines in detail, the complex behavioral processes which determine consumer actions and analyzes the decision patterns in a variety of situations with a special reference to individual and group influences. It is designed to cover contemporary concepts in consumer behavior, objectives, consumer and market segmentation, environmental influence, individual determinants, and consumer buying behavior.

Equivalent Course(s) BA 5123, BE 484, EN 2403

Course Name	Financial Markets and Institutions	**Credit Hours**	**3** (3,0)
Course Code	BA 3501	**Prerequisite(s)**	BA 2401

Course Description

A theoretical course that focuses on financial markets includes bond, equity and the effect of the economy upon the markets when funds are injected into the economic system through financial intermediaries. Topics include; interest rates the flow of funds, capital markets, debt market, money markets and their relationship with changing financial services and regulatory agencies. Other topics include roles of banks, finance companies, insurance companies and fund management companies. The study of Financial Market and Institutions (FMI) is one of the most important areas for finance and business students. The course has been designed to enable the students to understand the existing setup of financial markets, instruments and institutions.

Equivalent Course(s) BA 5135, AF 3501

Course Name	Sales & Retail Management	**Credit Hours**	3 (3,0)
Course Code	BA 4824	**Prerequisite(s)**	BA 3602

Course Description

This course focuses on the management of an organization's personal selling functions which include the: 1. Formulation of a strategic sales program. 2. Implementation of the sales program and, 3. Evaluation and control of the sales force performance. This course comprises of an approach to understand the above stated sets of decisions and processes, through text and cases on sales management topics and also through sharing of the facilitator's own experiences and observations, gained while serving various multinational and national sales and marketing organizations.

Equivalent Course(s) BA 3604

Course Name	Business Research Methods	**Credit Hours**	**3** (3,0)
Course Code	BA 3603	**Prerequisite(s)**	BA 3605

Course Description

This course provides the understanding of basic business research methods in the field of marketing, human resource management, and finance. The subject encompasses the theory and practice of research; and covers concepts, elements, and process of conducting business research. It builds the specific conceptual knowledge regarding identification and elicitation of research problem, development of research proposal, reviewing the literature, using suitable research methodology, data collection and analysis tools and writing research report. The focus of the course is on basic concept building and relating the research to real life business problems.

Equivalent Course(s)

SS 3504, AF 3609

Course Name	Staffing/Compensation and Employee development	**Credit Hours**	**3** (3,0)
Course Code	BA 4703	**Prerequisite(s)**	BA 4804

Course Description

This course focuses on strategies and tool to create organizational excellence through a continuous cycle of Recruitment & Selection. It explains pragmatic approaches for maintaining distinctive competence in knowledge workers by identifying high quality talent; creation of technological strategies to recruit high quality talent.

Equivalent Course(s)

None

Course Name	Research Project	**Credit Hours**	**6** (6,0)
Course Code	BA 4807	**Prerequisite(s)**	BA 3603

Course Description

The research project course is the application of the theory and concepts learned across various courses in BABS program. It is a team-based project to demonstrate the understanding of interdisciplinary knowledge and soft skills. It is based on identifying and solving a problem from any one specific field of business e.g. management, marketing, finance, or human resource management. It consists of understanding the real life business and industry problem, formulating the research questions, identifying appropriate methodology to answer the research questions, collecting and analyzing data from the field, and reporting the findings by using the scientific methods of research.

Equivalent Course(s)

AF 4807

Course Name	Project Management	**Credit Hours**	**3** (3,0)
Course Code	BA 4814	**Prerequisite(s)**	BA 3607

Course Description

The course is split into three parts: Project Initiation, Project Implementation, and Project Termination. Topics include: definition of a project, importance of project management, project life cycle, types of projects, project management and related industries, project initiation and selection, project manager, project organization, project planning, conflicts and negotiation, project implementation, budgeting and cost estimation, scheduling, resource allocation, monitoring and information systems, project control, project termination, and project auditing. Furthermore, the course covers project feasibility study, format of feasibility study, contents of feasibility study, and making accurate estimates.

Equivalent Course(s) Finance Elective

Course Name	Operations & Supply Chain Management	**Credit Hours**	**3** (3,0)
Course Code	BA 4128	**Prerequisite(s)**	BA 1203

Course Description

Study of the process directly related to the creation and distribution of goods and services. Increasingly, these operations are taking place outside the boundaries of a traditional enterprise. This course teaches students how to analyze processes, ensure quality, create value, and manage the flow of information, products and services across a network of customers, enterprises and supply chain partners.

Equivalent Course(s) BA 3607, EN 2406, BA 4128

Course Name	Managing Across Global Environment	**Credit Hours**	**3** (3,0)
Course Code	BA 4127	**Prerequisite(s)**	BA 1203

Course Description

The purpose of this course is to explore cultural dimensions of international management in view of increasing cultural differences between individuals and groups within and between organizations as a result of globalization. Culture is defined in its widest sense as the accumulation of knowledge, experience, beliefs, values, attitudes, meanings, hierarchies, religion, notions of time, roles, spatial relations, concepts of the universe, and material objects and possessions: acquired by a group of people in the course of generations through individual and group behavior. Thus culture is communication and communication is culture.

Equivalent Course(s) None

1.1.3 Bachelor of Science in Accounting & Finance (BS A&F)

Students enrolled in the BS (A&F) program are required to complete 46 courses with a 6 credit hour Research Project within six (6) years. The break-up of 46 courses and project (144 credit hours) is as follows:

- *46 Compulsory Courses (138 Credit Hours)*
- *1 Research Project (6 Credit Hours)*

1.1.3 Bachelor of Science in Accounting & Finance (BS A&F)

All courses may not be offered every year. Alternate courses may be substituted as and when required.

1.1.3 Bachelor of Science in Accounting & Finance (BS A&F)

Compulsory Courses

The description of 46 compulsory courses and the Research Project, as required for the BS (A&F) degree, is given below:

Course Name	Business Mathematics	**Credit Hours**	**3** (3,0)
Course Code	AF 1101	**Prerequisite(s)**	None

Course Description

The aim of this course is to prepare students to solve economic and managerial problems through mathematical concepts. This course is covered in three parts; first part is based on systems of linear equations and its solutions to provide preliminary concepts, construction of linear equations, graphical interpretation of data, systems of linear equations and solutions, introduction to matrix algebra, determinants, Cramer's rule & inverse method to solve system of linear equations. The second part develops the concept of linear and nonlinear functions, and their application, linear programming. The third part provides mathematics for finance, which covers simple, and compound interest rate computations and present and future annuity calculations.

Equivalent Course(s) BIO 1107, BA 1204, EN 1101

Course Name	Computer Concepts and Application	**Credit Hours**	**3** (3,0)
Course Code	AF 1102	**Prerequisite(s)**	None

Course Description

This course deals with the introduction to information technology, understanding the computer system, computer hardware, operating system, application software, programming languages, files and data basics, data communication, networking basics, computer graphics, computer security and controls, MS Word, MS Excel, MS Access, MS Power Point, MS Project and Databases.

Equivalent Course(s) BA 1103, BA 1108, EN 1102

Course Name	Introduction to Financial Accounting	**Credit Hours**	**3** (3,0)
Course Code	AF 1104	**Prerequisite(s)**	None

Course Description

This course covers the purpose and nature of accounting, forms of business enterprises, accounting information users, Generally Accepted Accounting Principles, accounting equation, accounting process, accounting cycle, ledgers and entries, accounting for receivables, inventory and depreciation.

Equivalent Course(s) BA 1101, EN 1103

1.1.3 Bachelor of Science in Accounting & Finance (BS A&F)

Course Name	Pakistan Studies	**Credit Hours**	**3** (3,0)
Course Code	AF 1105	**Prerequisite(s)**	None

Course Description

This course provides an introduction to the history of Pakistan with reference to pre- and post-independence eras, and the contribution of different governments in nation's social, economic and legislative development over years.

Equivalent Course(s)

BA 1213, EN 1107, ME 2306,

Course Name	Communication Skills	**Credit Hours**	**3** (3,0)
Course Code	AF 1203	**Prerequisite(s)**	None

Course Description

In this course student' learns the principles of a good presentation and has the opportunity to practice and experience these principles during this highly participative course. The course explores in detail, both verbal and non-verbal communication characteristics, and the importance of body-language expressions. Students are challenged through participative exercises with focus on active listening and observation techniques, that aim to make them competent in all facets of effective speech communication.

Equivalent Course(s)

CSC 2101, ME 1101, BA 1206, EN 1106

Course Name	Islamic Studies/Humanities	**Credit Hours**	**3** (3,0)
Course Code	AF 1205	**Prerequisite(s)**	None

Course Description

Islamic Studies gives an introduction to basic principles of Islam, followed by topics, such as; *Ibadaat* (Worship), *Amr Bil Maroof wa Nahi anl Munkir* (i.e. commands and prohibition), Islam's concept of knowledge, comparison with science, life history of the Prophet Muhammad (Peace and Blessings of Allah be upon Him), unity of Ummah ; *Kasb-e-Halal* (lawful earning) and obligations of a Muslim. In addition, fundamental human rights and minorities, Islamic society, maintaining identity in a non-Islamic state, Islamic politics, problems faced by Muslims and the status of women in Islam are covered.

Equivalent Course(s)

BA 1113, EN 1207, ME 1106

1.1.3 Bachelor of Science in Accounting & Finance (BS A&F)

Course Name	English Comprehension	**Credit Hours**	**3** (3,0)
Course Code	AF 1103	**Prerequisite(s)**	None

Course Description

This course covers comprehending problems and statements, developing arguments, and communicating ideas clearly and concisely. It also focuses on grammar, forms of punctuation, forms of speech, sentence and paragraph construction, composition, comprehension, writing styles, presentations, verbal communication skills, formal and informal presentations, interactive discussions, and role-playing.

Equivalent Course(s)

CSC 1102, MD 1122, SS 1116, BIO 1111, BA 1105

Course Name	Business Management and Ethics	**Credit Hours**	**3** (3,0)
Course Code	AF 1207	**Prerequisite(s)**	None

Course Description

This course introduces management principles and ethics, major functions of management and major practices of ethics and issues facing the business community. Topics include planning, organizing, staffing, leading and control. This competency-based course trains students in business administration & management. It will provide students with an understanding of the basic theories and principles by which businesses are organized and managed in modern society considering obligations towards society. They will demonstrate competency by analyzing management functions, principles, and processes that contribute to the achievement of organizational goals.

Equivalent Course(s)

BA 5419

Course Name	Advanced Financial Accounting	**Credit Hours**	**3** (3,0)
Course Code	AF 1201	**Prerequisite(s)**	AF 1104

Course Description

This course builds up on the Introductory Accounting course and presents the underlying framework and concepts of Financial Accounting in the context of overall business environment. Financial accounting is the basic means of recording and reporting financial information in a business. Students will learn how accounting supports economic decision making and provides value to entities and society. Students will discover the uses of financial statements and related information and will expand their knowledge about types of business organizations by learning about merchandising companies. Topics examined include those related to corporate financial position, operating results, and financial assets. Students will also study the basic accounting system and will be shown how the various accounting alternatives for recording financial transactions impact results.

Equivalent Course(s)

BA 1201

1.1.3 Bachelor of Science in Accounting & Finance (BS A&F)

Course Name	Introduction to Psychology	**Credit Hours**	**3** (3,0)
Course Code	AF 2303	**Prerequisite(s)**	None

Course Description

This course covers the basics of psychological features of human behavior with applications in real life situations. In addition, the aspects of personal growth and understanding are covered. Topics include human information processing, learning and memory, motivation, development, language acquisition, social psychology, and personality.

Equivalent Course(s) BA 2312, SS 2306, EN 1104

Course Name	Introduction to Sociology	**Credit Hours**	**3** (3,0)
Course Code	AF 2304	**Prerequisite(s)**	None

Course Description

This course focuses on three central themes; social change, social inequality, and social harmony versus conflict. It combines selective theoretical texts with case studies to understand the mechanisms and institutions that can trigger, foster, sustain, or undermine each of the three processes. In addition, the course covers the work of major sociological thinkers and the influence of sociology on modernization, race, citizenship, culture, gender, society, and economic development

Equivalent Course(s) BA 2307, SS 2307, EN 1203

Course Name	Principles of Micro Economics	**Credit Hours**	**3** (3,0)
Course Code	AF 2405	**Prerequisite(s)**	None

Course Description

Microeconomics covers how the individual parts of the economy, the households and the firms, make decisions to allocate limited resources. This course is based on a comprehensive study of the market structures, product markets and resource markets. It also deals with application of demand and supply, cost analysis and factors of production.

Equivalent Course(s) SS 1105, BA 1102, EN 1205

Course Name	Calculus for Business Studies	**Credit Hours**	**3** (3,0)
Course Code	AF 1202	**Prerequisite(s)**	AF 1101

Course Description

This course covers derivatives, results of differentiation, derivatives of logarithmic exponential and trigonometric functions, differentials, growth and decay models, definite and indefinite integrals, techniques of integration, integrals involving logarithmic, exponential and trigonometric functions, integration by tables, area under curve and between curves, functions of several variables, partial derivatives and their application to optimization.

Equivalent Course(s) BA 2404

1.1.3 Bachelor of Science in Accounting & Finance (BS A&F)

Course Name	Principles of Marketing	**Credit Hours**	**3** (3,0)
Course Code	AF 1206	**Prerequisite(s)**	None
Course Description	This course introduces the basic concepts of marketing, marketing environment, planning and research, market segmentation and targeting, consumer behavior, industrial marketing, product planning, product-mix, pricing, distribution, placement, promotional mix, and marketing in global scenarios.		
Equivalent Course(s)	BA 5404, BA 2303, EN 2305		

Course Name	Cost Accounting	**Credit Hours**	**3** (3,0)
Course Code	AF 2302	**Prerequisite(s)**	AF 1201
Course Description	Cost Accounting covers all key cost accounting topics, including inventory valuation, financial statements of a manufacturing concerns, job order costing, process costing, and standard costing. The course also covers the role of the cost accountant in setting prices, not only to outside customers, but also to other subsidiaries. The course delves into many other areas of concern to the cost accountant, including target costing, constraint analysis, budgeting, capital budgeting, the cost of quality, and cost collection systems.		
Equivalent Course(s)	BA 2408		

Course Name	Organizational Behavior	**Credit Hours**	**3** (3,0)
Course Code	AF 2305	**Prerequisite(s)**	AF 2303
Course Description	This course covers the subject matter on three levels: individual, group and interpersonal, and organizational. At the individual level, the focus is to examine individual behavior and differences, learning, perception, personality, motivation, and stress. The group/ interpersonal level covers group and inter-group behavior, creativity, and team decision-making. It also includes power, conflict, leadership, and communication. At the organizational level, it reviews the basics of organizational culture, organizational change and development, structure, design, employment relationship, and career management.		
Equivalent Course(s)	BA 3504, BA 5207, EN 2306		

Course Name	Principles of Macro Economics	**Credit Hours**	**3** (3,0)
Course Code	AF 3505	**Prerequisite(s)**	AF 2405
Course Description	This course introduces key economic indicators, role of government in an economy, measurement of gross domestic product, components of aggregate demand, consumption function and Keynesian multiplier, investment function, government intervention through monetary and fiscal policies, impact of government intervention on economic activity, inflation and unemployment, aggregate supply and demand, balance of payments and trade, public finance, growth, and development.		
Equivalent Course(s)	SS 1205, BA 1202, EN 2303		

1.1.3 Bachelor of Science in Accounting & Finance (BS A&F)

Course Name	Introduction to Business Finance	**Credit Hours**	**3** (3,0)
Course Code	AF 4703	**Prerequisite(s)**	AF 1201

Course Description

This course starts with introducing concept of wealth maximization for shareholders, strategic goals of firm, and covers the concepts of business environment, financial environment, Money & Capital markets, financial institutions and interest rates, analyses of financial statements, time value of money, sources of short-term and long-term finance, working capital management, valuation of financial securities (debt/equity) and capital budgeting.

Equivalent Course(s)

BA 5401, BA 2301, EN 2301

Course Name	Business and Technical English Writing	**Credit Hours**	**3** (3,0)
Course Code	AF 2301	**Prerequisite(s)**	AF 1203, AF1103

Course Description

This course helps students to analyze and produce typical office documents, such as letters, memoranda, presentations, proposals, and reports. Through individual and collaborative projects students develop purpose-driven messages that reflect the needs of professional audiences and the physical, stylistic, and social constraints of various media, genres, and situations and learn revising fact sheets according to plain language principles, developing clear instructions, and conducting and reporting on usability tests.

Equivalent Course(s)

None

Course Name	Management Accounting	**Credit Hours**	**3** (3,0)
Course Code	AF 2401	**Prerequisite(s)**	AF 2302

Course Description

The course builds up on the knowledge acquired in Cost Accounting and aims to develop knowledge & skills with respect to Management Accounting. The course focuses on understanding, need & application of alternative models of Management Accounting. Then the course introduces CVP Analysis in a multi-product environment, understanding Limiting Factor & conduct analysis under limits. Decision-making is a key element of this course and covers Decision Making under Relevant Costing & Strategic Costing. Pricing techniques & mechanisms are also covered within the course. The syllabus covers Budgeting here as well with different techniques and understanding their problems.

Equivalent Course(s)

None

1.1.3 Bachelor of Science in Accounting & Finance (BS A&F)

Course Name	Accounting and Financial Information Systems	**Credit Hours**	**3** (3,0)
Course Code	AF 3501	**Prerequisite(s)**	AF 1201

Course Description

This course covers the knowledge and skills needed to function within cutting edge accounting information systems that integrate information technology and software in the transactions control procedures and financial reporting cycles. It will also cover, how to be proactive accountants to improve the analysis and design of the Accounting Information Systems (AIS) to add a real value to business organizations, protect business information and its net worth. This course also encompasses issues such as advising businesses about security risks which affect the business internal control systems over financial documentation, record keeping and reporting. In addition, the course would include using accounting software in designing an accounting information system for a small-to-medium size business.

Equivalent Course(s) None

Course Name	Management Information Systems	**Credit Hours**	**3** (3,0)
Course Code	AF 2402	**Prerequisite(s)**	AF 1102

Course Description

This course covers different information technology applications in business for efficient management of business operations by providing support to decision makers for strategic business decisions. The course examines various corporate frameworks for information management and their utility.

Equivalent Course(s) BA 4704

Course Name	Money and Banking	**Credit Hours**	**3** (3,0)
Course Code	AF 2404	**Prerequisite(s)**	AF 3505

Course Description

This course offers a systematic analysis of financial system. The course will cover the structure and importance of the financial system, the functions of money, behavior of interest rates, financial structure and asymmetric information, bank management and regulation, structure of central and commercial banks' balance sheet, Functions of clearing house, Deposit creation process, debates on macroeconomic and monetary policies, BASEL I, II, III, Capital Adequacy Calculations, Value at risk, Operational risk and Credit Risk. In addition, commodity markets, hedging instruments, different functions of treasury, corporate and consumer banking department are introduced.

Equivalent Course(s) BA 2401

1.1.3 Bachelor of Science in Accounting & Finance (BS A&F)

Course Name	Statistics and Probability	**Credit Hours**	**3** (3,0)
Course Code	AF 2406	**Prerequisite(s)**	AF 1101

Course Description

This basic course aims to enhance the capacity of the students to solve the research problems by focusing on four areas; introduction to statistics, types of data, frequency distribution, graphs and charts, measures of central tendency, and measures of dispersion; concept of curve fitting techniques, regression analysis, correlation analysis, time series analysis; and index numbers, counting techniques, MS Excel tools for statistics using add-on analysis tool pack.

Equivalent Course(s)

BIO 1208, BA 2311

Course Name	Corporate Accounting	**Credit Hours**	**3** (3,0)
Course Code	AF 3607	**Prerequisite(s)**	AF 1104, AF 1201

Course Description

This course introduces students to the corporate accounting and the external financial reporting environment. The focus throughout the course is on the preparation of general purpose financial reports that comply with the Companies Act 2017 and International Accounting Standards/International Financial Reporting Standards issued by the International Accounting Standards Board (IASB). The course begins by covering the regulatory environment in which general purpose financial statements are prepared. It then covers the conceptual framework, principles of disclosure and requirements for the presentation of the financial statements, measurement principles applied in the preparation of financial statements, accounting for leases, Revenue recognition, associated concerns and group accounting. Additionally the course covers statement of cashflows in depth and analysis of financial statements, how to deal with Earnings Per Share, Accounting in case of winding-up a business and how financial statements of a Bank is prepared and how is different.

Equivalent Course(s)

None

Course Name	Auditing-I	**Credit Hours**	**3** (3,0)
Course Code	AF 3511	**Prerequisite(s)**	AF 1201

Course Description

This introductory course equips students with the basic knowledge of what is Audit & Assurance. The course covers role and background of IFAC, ISAAB and their applicability in Pakistan in conjunction with Local Regulations. The syllabus then takes into account Professional Ethics for Accountants as provided by IFAC. Internal Controls & Internal Audit is another key area of this course, while the course also introduces students with basic understanding of how to conduct an audit, key areas to test while stressing on the importance of IT systems.

Equivalent Course(s)

None

1.1.3 Bachelor of Science in Accounting & Finance (BS A&F)

Course Name	Statistical Inference	**Credit Hours**	**3** (3,0)
Course Code	AF 3506	**Prerequisite(s)**	AF 2406

Course Description

The course covers probability; probability distributions; Binomial, Poisson, Hyper-geometric, Chi Square distribution, Normal distribution, sampling distribution; estimation; hypothesis testing; one-population test, two-populations test and analysis of variance; and computer applications in statistics.

Equivalent Course(s)

SS 2418, BA 3605

Course Name	Financial Institutes and Markets	**Credit Hours**	**3** (3,0)
Course Code	AF 3507	**Prerequisite(s)**	None

Course Description

A theoretical course that focuses on financial markets includes bond, equity and the effect of the economy upon the markets when funds are injected into the economic system through financial intermediaries. Topics include: interest rates, the flow of funds, capital markets, debt market, money markets and their relationship with changing financial services and regulatory agencies. Other topics include roles of banks, finance companies, insurance companies and fund management companies. The study of Financial Market and Institutions (FMI) is one of the most important areas for finance and business students. The course has been designed to enable the students to understand the existing setup of financial markets, instruments and institutions.

Equivalent Course(s)

BA 3501

Course Name	Taxation	**Credit Hours**	**3** (3,0)
Course Code	AF 3606	**Prerequisite(s)**	None

Course Description

This course introduces students to the tax environment of Pakistan, starting from the authorities, their scope and jurisdiction etc. Then the course explains various forms of tax, difference regarding tax evasion & avoidance, payment procedures, exemptions available and penalties thereof. The course also covers comprehensive computations related to income tax, tax payable, surcharges, CGT tax and sales tax for individuals, AOPs and Companies.

Equivalent Course(s)

None

Course Name	Islamic Banking and Finance	**Credit Hours**	**3** (3,0)
Course Code	AF 3608	**Prerequisite(s)**	None

Course Description

This course explores the growth of Islamic banking into an international multi-billion dollar venture covering both the Islamic and non-Islamic worlds, the relationship between finance and Islamic law, basic principles of Islamic economics, the framework of Islamic finance, the nature of Islamic banking and finance, the concept of money in Islam, the prohibition of interest, the ethical dimension of Islamic banking, the financing mechanisms used in Islamic banking and the supervision of Islamic banks both by the central banks and by the Shariah supervisory boards, and how Islamic banking differs from the conventional interest-based banking system

Equivalent Course(s) None

Course Name	Auditing-II	**Credit Hours**	**3** (3,0)
Course Code	AF 3611	**Prerequisite(s)**	AF 3511

Course Description

This course builds up on the knowledge obtained in the previous course of Audit. The course covers the importance of regulations with respect to preventing money laundering and fraud and the role of audit in this aspect. Further the course stress on how professional accountants should behave and act in case of ethical dilemmas and conflict with fundamental principles. Later the course covers in depth the steps required to perform a financial audit i.e. evidence, sampling and procedures, audit related to various asset classes and liabilities are then covered. The syllabus also covers other aspect and review engagements. IN the end the syllabus explain the audit for a not-for-profit organization.

Equivalent Course(s) None

Course Name	Marketing Management	**Credit Hours**	**3** (3,0)
Course Code	AF 2403	**Prerequisite(s)**	AF 1206

Course Description

This course introduces the concept of customer and market-driven management. This course covers organizations' external and internal environment, strengths, weaknesses, opportunities and threats, marketing information system, buyer behavior analysis, segmenting, targeting and positioning strategies, product and pricing strategies, an in-depth study of strategy building by organizations with the help of case studies and a practical, hands-on learning experience of marketing management through close observations of marketing management at different levels in marketing channels.

Equivalent Course(s) BA 5106, BA 3602

1.1.3 Bachelor of Science in Accounting & Finance (BS A&F)

Course Name	Financial Reporting	**Credit Hours**	**3** (3,0)
Course Code	AF 3605	**Prerequisite(s)**	AF 3607

Course Description

The course introduces Conceptual Framework of Financial Reporting and covers Accounting/Reporting standards IAS 36, IAS 32, IAS 12, IAS 41, IAS 8, IAS 10, IAS 20, IAS 21, IFRS 5, IFRS 9, IFRS 7, IFRS 3, 10 & 13. The course covers various aspects of consolidation (including different types of group structures) and then takes into out Not-For-Profit & Public Sector Entities.

Equivalent Course(s) None

Course Name	Business and Labor Law	**Credit Hours**	**3** (3,0)
Course Code	AF 4701	**Prerequisite(s)**	None

Course Description

The course covers process of legislation in Pakistan and cover understanding and concepts related to various Business/Mercantile Laws and Labor Laws. In particular, the course will cover Contract Act, Law of Sale of Goods, Partnership Law, Negotiable Instruments Act, Trust Act and several other Business/Labor related Laws/Act as applicable in Pakistan.

Equivalent Course(s) EN 2401, BA 4801

Course Name	Financial Management	**Credit Hours**	**3** (3,0)
Course Code	AF 4702	**Prerequisite(s)**	AF 4703

Course Description

The syllabus for Financial Management, is designed to equip candidates with the skills that would be expected from a finance manager responsible for the finance function of a business. It prepares candidates for more advanced and specialist study in Corporate Finance. Therefore, the coursestarts by introducing the role and purpose of the financial management function within a business. Before looking at the three key financial management decisions of investing, financing, and dividend policy, the syllabus explores the economic environment in which such decisions are made. The next area introduced is financing decisions. This section of the syllabus starts by examining the various sources of business finance and how much finance can be raised from within the business. It also looks at the cost of capital and other factors that influence the choice of the type of capital a business will raise. The principles underlying the valuation of business and financial assets, including the impact of cost of capital on the value of business, is also covered. The syllabus finishes with an introduction to, and examination of, investing decisions. This is done in two stages - investment in (and the management of) working capital and the appraisal of long-term investments.

Equivalent Course(s) BA 5105, BA 3601

Course Name	Business Research Methodologies	**Credit Hours**	**3** (3,0)
Course Code	AF 3609	**Prerequisite(s)**	AF 3506

Course Description

This course provides the understanding of basic business research methods in the field of marketing, human resource management, and finance. The subject encompasses the theory and practice of research; and covers concepts, elements, and process of conducting business research. It builds the specific conceptual knowledge regarding identification and elicitation of research problem, development of research proposal, reviewing the literature, using suitable research methodology, data collection and analysis tools and writing research report. The focus of the course is on basic concept building and relating the research to real life business problems.

Equivalent Course(s) SS 3504, BA 3603

Course Name	Company Law	**Credit Hours**	**3** (3,0)
Course Code	AF 4707	**Prerequisite(s)**	None

Course Description

The course focus is primarily on the understanding the requirements and application of Corporate Law in accordance with Companies Act 2017 & Securities Act 2015.

Equivalent Course(s) None

Course Name	Corporate Finance	**Credit Hours**	**3** (3,0)
Course Code	AF 4801	**Prerequisite(s)**	AF 4702

Course Description

This course covers corporate finance and capital markets, emphasizing the financial aspects of managerial decisions. It touches on all areas of finance, including the valuation of real and financial assets, risk management and financial derivatives, the trade-off between risk and expected return, and corporate financing and dividend policy. Also, the course draws heavily on empirical research to help guide managerial decisions.

Equivalent Course(s) None

Course Name	e-Commerce	**Credit Hours**	**3** (3,0)
Course Code	AF 3603	**Prerequisite(s)**	None

Course Description

A comprehensive overview of how firms compete in today's environment with a focus on strategic choices and the infrastructures affecting e-commerce including technology, capital, media, and public policy. The strategy formulation process in covered by focusing on its six interrelated decision areas; market opportunity analysis, business models, customer interface, market communications, implementation and metrics, as well as the four infrastructures affecting the strategy process: technology, media, capital and public policy.

Equivalent Course(s) None

Course Name	Final Project-I	**Credit Hours**	**6** (6,0)
Course Code	AF 4XXX	**Prerequisite(s)**	AF 3609

Course Description

The Final project is the application of the theory and concepts learned across various courses in BS A&F program. It is a team-based project to demonstrate the understanding of interdisciplinary knowledge and soft skills. It is based on identifying and solving a problem from the accounting and finance. It consists of understanding the real life business and industry problem, formulating the research questions, identifying appropriate methodology to answer the research questions, collecting and analyzing data from the field, and reporting the findings, by using the scientific methods of research.

Equivalent Course(s) BA 4807

Course Name	Introduction to Human Resource Management	**Credit Hours**	**3** (3,0)
Course Code	AF 1204	**Prerequisite(s)**	AF 2350

Course Description

This course examines the role of the human resource professional, as a strategic partner, in managing contemporary organizations. The course introduces concepts, issues and practices in human resource management such as Human Resource planning, job design and analysis, recruitment and selection, training and development, performance appraisal, compensation and benefit management, career planning and development, employee relations, appraising the implications of legal and global environments and analyzing the current issues (such as diversity training, sexual harassment policies, and rising benefit costs), and best practices of employers of choice.

Equivalent Course(s) BA 5205, BA 4804, EN 3602

1.1.3 Bachelor of Science in Accounting & Finance (BS A&F)

Course Name	Pakistan Economic Policy	**Credit Hours**	**3** (3,0)
Course Code	AF 2306	**Prerequisite(s)**	AF 3505

Course Description

This course is designed to provide students with critical information and knowledge about Pakistan economic environment. Starting with the historical background, covering topics such as agriculture, industry, public finance and social sector development. The course also reviews government interventions, like fiscal policy, monetary policy, trade policy, and income policies. Also included in this course are topics like institutional reforms, deregulation, privatization, denationalization, globalization and other policies/factors that affect business environment in Pakistan. The course ends with discussion on challenges ahead for the Pakistan Economy in the regional and global perspectives.

Equivalent Course(s) BA 3609

Course Name	Entrepreneurship and Small Business Management	**Credit Hours**	**3** (3,0)
Course Code	AF 3504	**Prerequisite(s)**	AF 1207, AF 4703

Course Description

This course focuses on ways in which entrepreneurs recognize opportunities, generate ideas, and organize resources to plan and run successful ventures that enable them to achieve their goals. Students are required to create an entrepreneurial venture as part of a practical learning activity. Through this hands-on experience, case studies, class discussions and text book readings students will have an opportunity to develop the values, traits, and skills most often associated with successful entrepreneurs.

Equivalent Course(s) BA 3502, BA 3517, EN 2404

Course Name	Final Project-II	**Credit Hours**	**6** (6,0)
Course Code	AF 3504	**Prerequisite(s)**	AF 3609

Course Description

The Final project is the application of the theory and concepts learned across various courses in BS A&F program. It is a team-based project to demonstrate the understanding of interdisciplinary knowledge and soft skills. It is based on identifying and solving a problem from the accounting and finance. It consists of understanding the real life business and industry problem, formulating the research questions, identifying appropriate methodology to answer the research questions, collecting and analyzing data from the field, and reporting the findings, by using the scientific methods of research.

Equivalent Course(s) BA 4807

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

SZABIST offers a four year (eight semesters) BS Entrepreneurship degree program of 144 credit hour and 2 apprenticeships. The students enrolled in the BS (Entrepreneurship) program are required to complete 45 courses with a 9 credit hour Capstone Project within six (6) years. The break-up of 45 courses and project (144 credit hours) is as follows:

- *41 Compulsory Courses (123 Credit Hours)*
- *4 Elective[04] Courses (12 Credit Hours)*
- *1 Capstone Project (9 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
EN 1103	Introduction to Accounting	49
EN 1107	Pakistan Studies	49
EN 1102	Computer Application in Business	49
EN 1106	Oral and written Communication	50
EN 1206	Personal Management	50
EN 1101	Business Mathematics and Calculus	50
	Spring Semester	
EN 1207	Islamic Studies /Humanities	51
EN 1209	Introduction to Social Science	51
EN 1208	Business Management and Ethics	51
EN 1201	Accounting for Business Operations	51
EN 2304	Managerial Statistics	52
EN 2404	Introduction to Entrepreneurship	52
	Second Year	
	Fall Semester	
EN 2308	Introduction to Entrepreneurial Behavior	52
EN 1202	Business and Electronic Communication	52
EN 2305	Marketing Principle	53
EN1205	Microeconomics	53
EN 4803	SME Management	53
EN 2307	Entrepreneurial Organization Planning	53
	Spring Semester	
EN 3601	Analysis of Pakistani Industries	54
EN 2403	Consumer Behavior	54
EN 2407	Legal framework for Entrepreneurs	54
EN 2303	Macroeconomics	54
EN 4802	Innovative Business Models	55
EN 3505	Marketing Research	55

04- List of Electives is given in Appendix B.

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

Course Code	Course Title	Page #
	Third Year	
	Fall Semester	
EN 3502	Business Plan Development	55
EN 3501	Business Analysis and forecasting	55
EN 3503	Entrepreneurial Marketing	56
EN 3504	Finance and Taxation for Entrepreneurs	56
EN 3605	Product Innovation & Design	56
EN 4703	Emerging Media	56
	Spring Semester	
EN 3609	Capstone Project-1	57
EN 3603	Launching a venture	57
EN3604	Logistic and Supply Chain Management	57
EN 4701	Issues in Pakistan's Economy	57
EN 3608	Social Entrepreneurship	58
EN3607	Business Development	58
	Fourth Year	
	Fall Semester	
EN 4709	Capstone Project-2	58
EN 4702	Financing a venture	58
EN 4707	Services Marketing	59
EN 4708	Technopreneurship	59
EN 4xxx	Elective-1	-
EN 4xxx	Elective-11	-
	Spring Semester	
EN 4809	Capstone Project-3	59
EN 3506	Sustainability and Technology	59
EN 4805	Entrepreneurial Leadership	60
EN 4804	Digital Entrepreneurship	60
EN 4xxx	Elective-III	-
EN 4xxx	Elective-IV	-

All courses may not be offered every year. Alternate courses may be substituted as and when required.

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

Compulsory Courses

The description of 41 compulsory courses and Capstone Project, required for the BS-Entrepreneurship degree, is given below:

Course Name	Introduction to Accounting	**Credit Hours**	**3** (3,0)
Course Code	EN 1103	**Prerequisite(s)**	None

Course Description

This course covers the purpose and nature of accounting, forms of business enterprises, accounting information users, generally accepted accounting principles, accounting equation, accounting process, accounting cycle, ledgers and entries, accounting for receivables, inventory and depreciation.

Equivalent Course(s) BA 1101, AF 1104

Course Name	Pakistan Studies	**Credit Hours**	**3** (3,0)
Course Code	EN 1107	**Prerequisite(s)**	None

Course Description

This course provides an introduction to the history of Pakistan with reference to pre- and post-independence eras, and the contribution of different governments in nation's social, economic and legislative development over years.

Equivalent Course(s) BA 1213, AF 1105, ME 2306

Course Name	Computer Application in Business	**Credit Hours**	**3** (3,0)
Course Code	EN 1102	**Prerequisite(s)**	None

Course Description

This course deals with the introduction to information technology, computer system, computer hardware, operating system, application software, programming languages, files and data basics, data communication, networking basics, computer graphics, computer security and controls, MS Word, MS Excel, MS Access, MS Power Point, MS Project and Databases used in a business environment.

Equivalent Course(s) BA 1103,CSC 1104, BIO 1104, AF 1102, BA 1108

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

Course Name	Oral and Written Communication	**Credit Hours**	**3** (3,0)
Course Code	EN 1106	**Prerequisite(s)**	None

Course Description	The course is aimed at improving English language communication and presentation skills, specifically aimed for business students. With a multidimensional approach, the course enables the students to practice the use of English in everyday usage and professional situations, building upon all four skills: listening, speaking, reading and writing. It prepares them to make effective presentations, with an awareness of the audience and utilizing appropriate verbal and non-verbal communication with the ability to respond to comments and negotiate their own point of view persuasively.
Equivalent Course(s)	None

Course Name	Personal Management	**Credit Hours**	**3** (3,0)
Course Code	EN 1206	**Prerequisite(s)**	None

Course Description	This course teaches students to discover themselves and make positive changes to achieve greater effectiveness at work, and in personal and interpersonal relationship. Students learn the combination of factors such as personality, communication style, self-esteem, time management, conflict, negotiation and others that impact their personal effectiveness. They also learn methods, and techniques required to work effectively and confidently with others, using time management, negotiation and presentation skills with a positive mindset.
Equivalent Course(s)	BA 1104, BA 1109

Course Name	Business Mathematics & Calculus	**Credit Hours**	**3** (3,0)
Course Code	EN 1101	**Prerequisite(s)**	None

Course Description	The aim of this course is to prepare students to solve economic and managerial problem through mathematical concepts. This course is covered in four parts, first part is based on systems of linear equations and its solutions. The second part develops the concept of linear and nonlinear functions, and their application, and linear programming. The third part provides mathematics for finance, which covers simple, and compound interest rate computations and present and future annuity calculations. The last part of the course provides differentiation of basic functions, higher order differentiation, optimization of functions, definite and indefinite integration, and applications of integration.
Equivalent Course(s)	BIO 1107, BA 1204, AF 1101

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

Course Name	Islamic Studies / Humanities	**Credit Hours**	**3** (3,0)
Course Code	EN 1207	**Prerequisite(s)**	None

Course Description

Islamic Studies gives an introduction to basic principles of Islam, followed by topics, such as; *Ibadaat* (Worship), *Amr Bil Maroof wa Nahi anl Munkir* (i.e. commands and prohibition) , Islam's concept of knowledge, comparison with science, life history of the Prophet Muhammad (Peace and Blessings of Allah be upon Him), unity of Ummah ; *Kasb-e-Halal* (lawful earning) and obligations of a Muslim. In addition, fundamental human rights and minorities, Islamic society, maintaining identity in a non-Islamic state, Islamic politics, problems faced by Muslims and the status of women in Islam are covered.

Equivalent Course(s) BA 1113, AF 1205, ME 1106

Course Name	Introduction to Social Science	**Credit Hours**	**3** (3,0)
Course Code	EN 1209	**Prerequisite(s)**	None

Course Description

This course focuses on three central themes; social change, social inequality, and social harmony versus conflict. It combines selective theoretical texts with case studies to understand the mechanisms and institutions that can trigger, foster, sustain, or undermine each of the three processes. The course covers the work of major sociological thinkers and the influence of sociology on modernization, race, citizenship, culture, gender, society, and economic development.

Equivalent Course(s) SS 2307, BA 2307, AF 2304

Course Name	Business Management & Ethics	**Credit Hours**	**3** (3,0)
Course Code	EN 1208	**Prerequisite(s)**	None

Course Description

This course introduces the basic concepts of management, evolution and emergence of management thought, management function, planning concepts, decision-making, organizing, staffing, leading, controlling, and future of management and society. Along with that it introduces contemporary and controversial ethical issues facing the business community. Topics include: moral reasoning, moral dilemmas, law and morality, equity, justice and fairness, ethical standards, and moral development.

Equivalent Course(s) BA 5419, BA 1203, AF 1106

Course Name	Accounting for Business Operation	**Credit Hours**	**3** (3,0)
Course Code	EN 1201	**Prerequisite(s)**	EN 1103

Course Description

This course focuses on cost allocation, process costing systems and spoilage. Specific topics include relevancy of revenues and costs, cost allocation decisions (joint and byproducts), process costing systems, factory overhead applied, standard costing: setting of standards, analysis of variance and controlling, and costing material.

Equivalent Course(s) BA 5411, BA 2408, AF 2302

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

Course Name	Managerial Statistics	**Credit Hours**	**3** (3,0)
Course Code	EN 2304	**Prerequisite(s)**	EN 1101
Course Description	This basic course aims to enhance the capacity of the students to solve the research problems by focusing on four areas; introduction to statistics, types of data, frequency distribution, graphs and charts, measures of central tendency, and measures of dispersion; concept of curve fitting techniques, regression analysis, correlation analysis, time series analysis; and index numbers, counting techniques and MS Excel tools for statistics using add-on analysis tool pack.		
Equivalent Course(s)	BIO 1208, BA 2311, AF 2406		

Course Name	Introduction to Entrepreneurship	**Credit Hours**	**3** (3,0)
Course Code	EN 2404	**Prerequisite(s)**	EN 1208
Course Description	This course focuses on ways in which entrepreneurs recognize opportunities, generate ideas, and organize resources to plan and run successful ventures that enable them to achieve their goals. Students are required to create an entrepreneurial venture as part of a practical learning activity. Through this hands-on experience, case studies, class discussions and text book readings students will have an opportunity to develop the values, traits, and skills most often associated with successful entrepreneurs.		
Equivalent Course(s)	BA 4859, BA 3517, BA 3502, AF 3504		

Course Name	Introduction to Entrepreneurial Behavior	**Credit Hours**	**3** (3,0)
Course Code	EN 2308	**Prerequisite(s)**	EN 1208
Course Description	Entrepreneurial behavior/mindset and characteristics, will give you the opportunity to consider and reflect on the personal aspects involved in transforming an innovative idea into an entrepreneurial product. You will also learn how to identify the requirements for building an appropriate entrepreneurial team.		
Equivalent Course(s)	None		

Course Name	Business and Electronic Communication	**Credit Hours**	**3** (3,0)
Course Code	EN 1202	**Prerequisite(s)**	EN 1106
Course Description	This introductory course teaches students to communicate at both personal and professional levels. In addition, it develops competency in all forms of communication. Also, this course introduces communication theories and strategies for a variety of business situations. Using a developmental approach to business communication, the course examines methods for organizing ideas, analyzing data, addressing diverse concerns, presenting information, and developing a professional communication style.		
Equivalent Course(s)	BA 5418, BA 2406		

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

Course Name	Marketing Principles	**Credit Hours**	**3** (3,0)
Course Code	EN 2305	**Prerequisite(s)**	EN 1204

Course Description

This course introduces the basic concepts of marketing, marketing environment, planning and research, market segmentation and targeting, consumer behavior, industrial marketing, product planning, product-mix, pricing, distribution, placement, promotional mix, and marketing in global scenarios.

Equivalent Course(s) BA 5404, BA 2303, AF 1206

Course Name	Microeconomics	**Credit Hours**	**3** (3,0)
Course Code	EN 1205	**Prerequisite(s)**	None

Course Description

Microeconomics studies how the individual parts of the economy, the households and the firms, make decisions to allocate limited resources. This course is based on a comprehensive study of the market structures, product markets and resource markets. It also deals with application of demand and supply, cost analysis and factors of production.

Equivalent Course(s) SS 1105, AF 2405, BA 1102

Course Name	SME Management	**Credit Hours**	**3** (3,0)
Course Code	EN 4803	**Prerequisite(s)**	EN 2404

Course Description

This course focuses on the importance and purpose of SMEs highlighting how to carry out efficient and effective small and medium business activities, in local and international markets. Students will learn the different obstacles faced by SMEs related to policy making, development of feasibility studies and interaction with both public and private sector institutions.

Equivalent Course(s) None

Course Name	Entrepreneurial Organization Planning-	**Credit Hours**	**3** (3,0)
Course Code	EN 2307	**Prerequisite(s)**	EN 1208

Course Description

Organizational planning involves deciding form of ownership that entrepreneurship intend to enter. Nature of planning, organizing, leading and controlling will be determined by nature of business or form of ownership.

Equivalent Course(s) None

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

Course Name	Analysis of Pakistani Industries	**Credit Hours**	**3** (3,0)
Course Code	EN 3601	**Prerequisite(s)**	EN 2303

Course Description

This course is designed to make student understand the characteristics, nature of competition, growth potential, current trends, history, concurrent issues and its importance in context of Pakistan's economic scenario. Also, the course identifies the impact of these prevailing trends on businesses operating in different industries.

Equivalent Course(s) None

Course Name	Consumer Behavior	**Credit Hours**	**3** (3,0)
Course Code	EN 2403	**Prerequisite(s)**	EN 2305

Course Description

This course examines in detail, the complex behavioral processes which determine consumer actions and analyzes the decision patterns in a variety of situations with a special reference to individual and group influences. It is designed to cover contemporary concepts in consumer behavior, objectives, consumer and market segmentation, environmental influence, individual determinants, and consumer buying behavior.

Equivalent Course(s) BA 3507

Course Name	Legal Framework for Entrepreneurs	**Credit Hours**	**3** (3,0)
Course Code	EN 2407	**Prerequisite(s)**	EN 1208

Course Description

The aim of this course is to enable students from a variety of backgrounds to understand legal aspects of entrepreneurship. The knowledge they gain will enable them to seek appropriate legal advice and identify the areas that they need to address when engaged in entrepreneurial activity. On completion of this course, students should be able to display a broad understanding of Commercial Law and how it will impact entrepreneurial activity in several areas.

Equivalent Course(s) BA 3507

Course Name	Macroeconomics	**Credit Hours**	**3** (3,0)
Course Code	EN 2303	**Prerequisite(s)**	EN 1205

Course Description

This course introduces key economic indicators, role of government in an economy, measurement of gross domestic product, components of aggregate demand, consumption function and Keynesian multiplier, investment function, government intervention through monetary and fiscal policies, impact of government intervention on economic activity, inflation and unemployment, aggregate supply and demand, balance of payments and trade, public finance, growth, and development.

Equivalent Course(s) SS 1205, BA 1202, AF 3505

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

Course Name	Innovative Business Models	**Credit Hours**	**3** (3,0)
Course Code	EN 4802	**Prerequisite(s)**	EN 1208

Course Description

This course introduces students to various modern and unique business models and their critical components. The course will cover traditional and web based platform business models to give insights to the students on their synergy with the business environment.

Equivalent Course(s) None

Course Name	Marketing Research	**Credit Hours**	**3** (3,0)
Course Code	EN 3505	**Prerequisite(s)**	EN 2305

Course Description

This course provides the understanding of basic research techniques. It will introduce the elements and process of conducting business research. It will build the concepts regarding problem identification, development of research problem, eliciting the theoretical framework, developing suitable research methodology, data collection and analysis tools, and report writing.

Equivalent Course(s) BA 4707

Course Name	Business Plan Development	**Credit Hours**	**3** (3,0)
Course Code	EN 3502	**Prerequisite(s)**	EN 2404, EN1208

Course Description

This course covers the process of identifying and quantifying market opportunities, planning, and starting a new enterprise in the Pakistani market. Students will adopt the lean model methodology and learn how to use a business model canvas to brainstorm, iterate, and develop an idea that is both viable and doable with actual figures and scenarios from the market

Equivalent Course(s) None

Course Name	Business Data Analysis	**Credit Hours**	**3** (3,0)
Course Code	EN 3507	**Prerequisite(s)**	None

Course Description

It has been estimated that organization's experience increase in productivity and become more profitable than their competitors when they lead with data-driven business decisions. As the world becomes ever more data-driven, analytical skills are in high demand but very short supply. This course equips you with the skills to give your organization a competitive advantage in any industry by using data to make decisions, extract business insights, and predict future trends. It provides you with the theoretical knowledge and practical skills to understand, interpret, and communicate data relevant to your role and organization.

Equivalent Course(s) None

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

Course Name	Entrepreneurial Marketing	**Credit Hours**	**3** (3,0)
Course Code	EN 3503	**Prerequisite(s)**	EN 2305
Course Description	This course covers different methods of conventional and non-conventional marketing carried out by startups and businesses by using market intelligence, guerrilla marketing, subversive marketing, disruptive marketing, radical marketing, viral marketing, convergence marketing and expeditionary marketing. Each reflects an alternative approach to marketing for a startup.		
Equivalent Course(s)	None		

Course Name	Finance and Taxation for Entrepreneurs	**Credit Hours**	**3** (3,0)
Course Code	EN 3504	**Prerequisite(s)**	EN 2407
Course Description	This course examines the elements of entrepreneurial finance and taxation, partly focusing on start-up ventures and the early stages of company development. The course addresses key questions which challenge all entrepreneurs: how much money can and should be raised; when should it be raised and from whom; what is a reasonable valuation of the company; and how should funding, employment contracts and exit decisions be structured. It aims to prepare students for these decisions, both as entrepreneurs and venture capitalists.		
Equivalent Course(s)	None		

Course Name	Product Innovation and Design	**Credit Hours**	**3** (3,0)
Course Code	EN 3605	**Prerequisite(s)**	EN 2404
Course Description	This course is designed to provide students with vital information on the development and launching of a new product or service. The course reviews different stages a product/service has to go through before reaching its final customer.		
Equivalent Course(s)	BA 4859		

Course Name	Emerging Media	**Credit Hours**	**3** (3,0)
Course Code	EN 4703	**Prerequisite(s)**	EN 3503
Course Description	In this course students will learn how new and emerging media technologies are being integrated into advertising and public relations campaigns, and how they are being used to deliver traditional messages in novel times and spaces. In an increasingly competitive and diversifying media space, communicators are finding new ways to reach their intended audiences. This course will foster an understanding of the roles and limitations of new media for delivering messages and engaging with key audiences, public and markets while allowing students to critically analyze how to best utilize new media to connect with consumers.		
Equivalent Course(s)	BA 4125		

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

Course Name	Capstone Project-1	**Credit Hours**	**3** (3,0)
Course Code	EN 3609	**Prerequisite(s)**	EN 3503

Course Description

In the capstone project students are supposed to work on a business idea and its feasibility through individual basis or working as apprentice with any entrepreneur thereby doing research and honing the skills before its application in the market.

Equivalent Course(s) None

Course Name	Launching a Venture	**Credit Hours**	**3** (3,0)
Course Code	EN 3603	**Prerequisite(s)**	EN 3502

Course Description

This course is designed to understand the process of converting a business idea or opportunity into a revenue generating business. It is aimed to identify and understand pre-business activities like; recognizing or generating business idea, feasibility of business ideas, in-depth market analysis, developing business model, making some strategic decisions and trade-offs. In addition, student will be able to differentiate various forms of businesses and their pertaining structures and legalities. Also, the course highlights the role of entrepreneur in developing strategic decisions.

Equivalent Course(s) None

Course Name	Logistics and Supply Chain Management	**Credit Hours**	**3** (3,0)
Course Code	EN 3604	**Prerequisite(s)**	EN 2406

Course Description

This course will provide understanding of overall logistics and supply chain process for startups. Also, it will cover various activities like transportation, production, distribution, warehousing, inventory management, purchasing of raw material and handling of semi produced products, and customer services. In addition, it will equip students with various tools, models and theories to operate in a business environment.

Equivalent Course(s) None

Course Name	Issues in Pakistan's Economy	**Credit Hours**	**3** (3,0)
Course Code	EN 4701	**Prerequisite(s)**	EN 3601

Course Description

This course is designed to provide students with critical information and knowledge about Pakistan economic environment. Starting with the historical background, it covers topics such as agriculture, industry, public finance and social sector development. The course also reviews government interventions, like fiscal policy, monetary policy, trade policy, and income policies. Further, the additional topics of this course includes: institutional reforms, deregulation, privatization, denationalization, globalization and other policies/factors that affect business environment in Pakistan. The course ends with discussion on challenges ahead for the Pakistan Economy in the regional and global perspectives.

Equivalent Course(s) SS 4249, BA 3609

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

Course Name	Social Entrepreneurship	**Credit Hours**	**3** (3,0)
Course Code	EN 3608	**Prerequisite(s)**	EN 2404

Course Description

The course is about using entrepreneurial skills to craft innovative responses to social problems. Entrepreneurs are particularly good at recognizing opportunities, exploring innovative approaches, mobilizing resources, managing risks and building viable enterprises. These skills are just as valuable in the social sector as they are in business. Social entrepreneurship applies to both profit and nonprofit firms who have programs designed to create social value.

Equivalent Course(s) None

Course Name	Business Development	**Credit Hours**	**3** (3,0)
Course Code	EN 3607	**Prerequisite(s)**	EN 2303, EN 2305

Course Description

Business development is the creation of long-term value for an organization from customers, markets, and relationships. The course will teach students the different strategies in business development, customer acquisition and growth and scaling up techniques for existing businesses. The course will cover real world examples and learnings by using case study methodology.

Equivalent Course(s) None

Course Name	Capstone Project-11	**Credit Hours**	**3** (3,0)
Course Code	EN 4709	**Prerequisite(s)**	EN 3609

Course Description

In this project student's will transform their ideas practically in the market. This stage is not confined to numbers, business plan or any financial statements rather it is utilizing both primary research and secondary research to develop their ideas and taking practical steps to start their company. Also, a mentor entrepreneur in the relevant field will be assigned to facilitate the students with the research and create a prototype product to test in the market for results.

Equivalent Course(s) None

Course Name	Financing a Venture	**Credit Hours**	**3** (3,0)
Course Code	EN 4702	**Prerequisite(s)**	EN 3504

Course Description

This course is for aspiring or active entrepreneurs who want to understand how to secure funding for their company. This course will demystify key financing concepts to give entrepreneurs and aspiring entrepreneurs a guide to secure funding.

Equivalent Course(s) None

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

Course Name	Services Marketing	**Credit Hours**	**3** (3,0)
Course Code	EN 4707	**Prerequisite(s)**	EN 2305

Course Description

The course studies the difference between marketing mix of tangible offerings and that of services; describing applications of services marketing; developing services marketing plan and practice services marketing, and developing entrepreneurial mindset in a service industry. The course focuses on marketing services through 7Ps, whether service is the primary business or a supplementary to a product.

Equivalent Course(s) None

Course Name	Technopreneurship	**Credit Hours**	**3** (3,0)
Course Code	EN 4708	**Prerequisite(s)**	EN 1102, EN2404

Course Description

This course is designed as an introduction to the rapidly evolving world on creative new venture in internet marketing. This course intends to give an understanding of Technopreneurship fundamentals. This course prepares the students to translate their business innovations into a technology start-up company. Students will get an opportunity to apply the skills learnt in this course to a start-up company.

Equivalent Course(s) None

Course Name	Capstone Project-111	**Credit Hours**	**3** (3,0)
Course Code	EN 4809	**Prerequisite(s)**	EN 4709

Course Description

The course will help students to implement the learnings of previous 2 capstone projects and check its success in the chosen market. The course represents the startup feasibility around six core elements, opportunity, innovation, calculated risk-taking, resource leveraging, proactive behavior, and customer intensity. A continuum is involved, to gauge the firm's external environment drive the need for a future entrepreneur to be well prepared against turbulence, discontinuities, rapid changes in technology and economy.

Equivalent Course(s) None

Course Name	Sustainability and Technology	**Credit Hours**	**3** (3,0)
Course Code	EN 3506	**Prerequisite(s)**	EN 2404

Course Description

This course is designed to articulate need for business growth and importance of sustainability practices in parallel. The course will introduce concepts of sustainability, significance and its role in economic, social and environmental settings. Also, the course incorporates social responsibility in value chain of business. In addition, explains role of technology and innovation in sustainable practices.

Equivalent Course(s) None

1.1.4 Bachelor of Science in Entrepreneurship (BS Entrepreneurship)

Course Name	Entrepreneurial Leadership	**Credit Hours**	**3** (3,0)
Course Code	EN 4805	**Prerequisite(s)**	EN 1204, EN2404

Course Description	The course will examine the Entrepreneurial Leadership (EL) factors needed to bring about enterprise transformation or transition from start-up and ongoing operations to what is frequently called enterprise building. Theories and related research will be examined, as will "best" and "worst" practices, using case studies, lectures, and outside speakers.
Equivalent Course(s)	None

Course Name	Digital Entrepreneurship	**Credit Hours**	**3** (3,0)
Course Code	EN 4804	**Prerequisite(s)**	EN 2404, EN1102

Course Description	This course is designed for those who are actively starting a new venture utilizing the internet and digital technologies. The course is not a software programming course but is an entrepreneurial strategy course focused on the nature of digital entrepreneurship. The course describes the internet and digital technologies as powerful tools for entrepreneurship, and offers students useful theory, strategy and assessment to explore these ideas.
Equivalent Course(s)	None

1.2.1 Master of Business Administration (MBA)

MBA

For students with 4-year undergraduate degree/16-years of education, the duration of the MBA program is 2 years. Twenty-two courses (66 credits) and Research Project (6 credits) or Thesis (6 credit hours) are needed to graduate. Students are also required to complete a six-week internship. The maximum duration to complete this degree is 4 years.

- *18 Core Courses (54 Credit Hours)*
- *4 Elective Courses[05] (12 Credit Hours)*
- *Research Project/Thesis (6 Credit Hours)**

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
BA 5301	Financial Accounting	63
BA 5419	Business Management & Ethics*	63
BA 5418	Managerial Communication*	63
BA 5502	Quantitative Tools for Managers *	63
BA 5302	Microeconomics*	64
BA 5106	Marketing Management*	64
	Spring Semester	
BA 5402	Microeconomics*	64
BA 5205	Human Resource Management*	65
BA 5411	Cost and Management Accounting*	65
BA 5401	Introduction to Business Finance*	65
BA 5405	Statistical Inference*	66
BA 5501	Applied Research Methods	66
	Second Year	
	Fall Semester	
BA 5308	International Business	66
BA 5601	Strategic Human Resource Management	67
BA 5105	Financial Management*	67
BA 5203	Strategic Marketing	67
BA 5508	Research Project-I (3 Credits) **OR**	68
BA 5507	Thesis-I (3 Credits)	68
BA 5xxx	Elective-I	-
	Spring Semester	
BA 5104	Strategic Management	69
BA 5208	Strategic Finance	69
BA 5608	Research Project-II (3 Credits) **OR**	69
BA 5607	Thesis-II(3 Credits)	70
BA 5xxx	Elective-II	-
BA 5xxx	Elective-III	-
BA 5xxx	Elective-IV	-

All courses may not be offered every year. Alternate courses may be substituted as and when required.

05- List of Electives is given in Annexure B.

*- Spread over two semesters (RP-I/Thesis-I, RP-II/Thesis-II).

1.2.1 Master of Business Administration (MBA)

The students with 4-year BBA/BABS/BS (Accounting & Finance)/BS (Entrepreneurship) or equivalent degree are exempted 36 credit hours of course work. Minimum duration of degree for such students will be 1.5-year with following program structure:

- *6 Core Courses (18 Credit Hours)*
- *4 Elective Courses[06] (12 Credit Hours)*
- *1 Research Project/Thesis (6 Credit Hours*)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
BA 5501	Applied Research Methods	66
BA 5203	Strategic Marketing	67
BA 5601	Strategic HRM	67
BA 5208	Strategic Finance	69
	Spring Semester	
BA 5104	Strategic Management	69
BA 5508	Research Project-I (3 Credits) **OR**	68
BA 5507	Thesis-I (3 Credits)	68
BA 5xxx	Elective-I	-
BA 5xxx	Elective-II	-
	Second Year	
	Fall Semester	
BA 5308	International Business	66
BA 5608	Research Project-II (3 Credits) **OR**	69
BA 5607	Thesis-II(3 Credits)	70
BA 5xxx	Elective-III	-
BA 5xxx	Elective-IV	-

All courses may not be offered every year. Alternate courses may be substituted as and when required.

06- List of Electives is given in Appendix B.

*- Spread over two semesters (RP-I/Thesis-I, RP-II/Thesis-II).

1.2.1 Master of Business Administration (MBA)

Compulsory Courses

Course Name	Financial Accounting	**Credit Hours**	**3** (3,0)
Course Code	BA 5301	**Prerequisite(s)**	None

Course Description

This course includes accounting for merchandise business, classified balance sheet, simple and multiple income statement, design of accounting system, accounts receivable, notes receivable, inventories, cost of goods sold, liabilities, corporation and measuring cash flow statements. Also, MS Excel is used and necessary accounting software is introduced.

Equivalent Course(s) None

Course Name	Business Management & Ethics	**Credit Hours**	**3** (3,0)
Course Code	BA 5419	**Prerequisite(s)**	None

Course Description

This course introduces the basic concepts of management, evolution and emergence of management thought, management function, planning concepts, decision-making, organizing, staffing, leading, controlling, and future perspective of management and society. The course also introduces contemporary ethical issues faced by the business community.

Equivalent Course(s) BA 1203, AF 1106, EN 1204

Course Name	Managerial Communication	**Credit Hours**	**3** (3,0)
Course Code	BA 5418	**Prerequisite(s)**	None

Course Description

This course is designed to develop the application of written oral and interpersonal communication theory in the business management environment. Areas of emphasis include the role of communication in contemporary organizations, considerations of message production and reception, internal versus external audiences, communicating change, intercultural communication, and ethics.

Equivalent Course(s) BA 2406, AF 2301, EN 1202

Course Name	Quantitative Tools for Managers	**Credit Hours**	**3** (3,0)
Course Code	BA 5502	**Prerequisite(s)**	None

Course Description

The course covers descriptive statistical tools and mathematical methods. Statistical tools consist of: frequency distribution, graphs, charts, mean and variance, percentiles, correlation and regression analysis. Mathematical methods consist of: matrices, system of linear equations, differentiation and optimization, linear programming and simplex method.

Equivalent Course(s) None

1.2.1 Master of Business Administration (MBA)

Course Name	Microeconomics	**Credit Hours**	**3** (3,0)
Course Code	BA 5302	**Prerequisite(s)**	None

Course Description

Microeconomics covers how the individual parts of the economy, the households and the firms, make decisions to allocate limited resources. This course is based on a comprehensive study of the market structures, product markets and resource markets. It also deals with application of demand and supply, cost analysis and factors of production.

Equivalent Course(s) SS 1105, BA 1102, EN 1205, AF 2405

Course Name	Marketing Management	**Credit Hours**	**3** (3,0)
Course Code	BA 5106	**Prerequisite(s)**	None

Course Description

This course introduces the concepts of marketing, marketing environment, planning and research. The course covers organizations' external and internal environment, strengths, weaknesses, opportunities and threats, marketing information system, buyer behavior analysis, segmenting, targeting and positioning strategies, product and pricing strategies, an in-depth study of strategy building by organizations with the help of case studies and a practical, hands-on learning experience of marketing management through close observations of marketing management at different levels in marketing channels.

Equivalent Course(s) None

Course Name	Macroeconomics	**Credit Hours**	**3** (3,0)
Course Code	BA 5402	**Prerequisite(s)**	BA 5302

Course Description

This course introduces key economic indicators, role of government in an economy, measurement of gross domestic product, components of aggregate demand, consumption function and Keynesian multiplier, investment function, government intervention through monetary and fiscal policies, impact of government intervention on economic activity, inflation and unemployment, aggregate supply and demand, balance of payments and trade, public finance, growth, and development.

Equivalent Course(s) SS 1205, BA 1202, EN 2303, AF 3505

1.2.1 Master of Business Administration (MBA)

Course Name	Human Resource Management	**Credit Hours**	**3** (3,0)
Course Code	BA 5205	**Prerequisite(s)**	BA 5419

Course Description

This course examines the role of the human resource professional, as a strategic partner, in managing contemporary organizations. The course introduces concepts, issues and practices in Human Resource Management (HRM) such as Human Resource planning, job design and analysis, recruitment and selection, training and development, performance appraisal, compensation and benefit management, career planning and development, employee relations, appraising the implications of legal and global environments and analyzing the current issues (such as diversity training, sexual harassment policies, and rising benefit costs), and best practices of employers of choice.

Equivalent Course(s) BA 4804, AF 1204, EN 3602

Course Name	Cost and Management Accounting	**Credit Hours**	**3** (3,0)
Course Code	BA 5411	**Prerequisite(s)**	BA 5301

Course Description

This course introduces cost concepts, classifications, behaviors, and assignment, usage of quantitative and qualitative tools and methods of preparing spreadsheet models to analyze data, account for specific industries and organizational structures, understand advantages, disadvantages, and appropriate usage of job-order costing, process costing, activity-based costing, variable costing, and standard costing, and computing and interpreting variances from budgets and standards.

Equivalent Course(s) BA 2408, AF 2302, EN 1201

Course Name	Introduction to Business Finance	**Credit Hours**	**3** (3,0)
Course Code	BA 5401	**Prerequisite(s)**	BA 5301

Course Description

This course covers the concepts of business environment, forms of business organization, overview of financial environment, cost markets, institutions and interest rates, analyses of financial statements, time value of money, sources of short-term and long-term finance, break even analysis, working capital management, valuation of financial securities (debt/equity) and introduction to capital budgeting.

Equivalent Course(s) BA 2301, AF 4703, EN 2301

1.2.1 Master of Business Administration (MBA)

Course Name	Statistical Inference	**Credit Hours**	**3** (3,0)
Course Code	BA 5405	**Prerequisite(s)**	BA5502

Course Description

This course covers probability; probability distributions; Binomial, Poisson, Hyper-geometric, Chi Square distribution, Normal distribution, sampling distribution; estimation; hypothesis testing; one-population test, two-populations test and analysis of variance; and computer applications in statistics.

Equivalent Course(s) BA 3605, AF 3506

Course Name	Applied Research Methods	**Credit Hours**	**3** (3,0)
Course Code	BA 5501	**Prerequisite(s)**	None

Course Description

This course equips students with the essential tools of research which forms the basis of sound decision-making. Through an applied approach using term report supplemented by classroom discussions and presentations, students gain knowledge of converting a business issue into a research problem; and applying the most appropriate methodology to solve this problem. The course provides an overview of applied research methodology and statistics. The general aims are to provide: a) an advanced understanding of research methods and data analysis, b) enhanced research literacy, and c) a greater understanding of the way in which research methodology and statistics are interwoven with theory and the practice.

Equivalent Course(s) None

Course Name	International Business	**Credit Hours**	**3** (3,0)
Course Code	BA 5308	**Prerequisite(s)**	None

Course Description

This course develops an understanding of the worldwide developments and foundations for international business and the cultural context for managing in an overseas environment. It provides an understanding of the macroeconomic and political changes that have taken place in the era of globalization and beyond globalization. It also helps to investigate the political economy of international business, trade and investment, In addition, describes and explains trade and the investment environment in which international business transactions occurs.

Equivalent Course(s) None

1.2.1 Master of Business Administration (MBA)

Course Name	Strategic Human Resource Management	**Credit Hours**	**3** (3,0)
Course Code	BA 5601	**Prerequisite(s)**	
		For MBA 72	BA 5205
		For MBA 36	None
Course Description	This course equips students to take strategic human resource decisions. The course is designed to involve students in practical activities ranging from assessment of the global economic environment and organizational culture to the analysis of competencies and the implementation of human resource decisions. Students carry out a detailed strategic analysis of a human resource management issue in organizations and, in doing so learn how to contribute in improving the performance, productivity, and morale.		
Equivalent Course(s)	None		

Course Name	Financial Management	**Credit Hours**	**3** (3,0)
Course Code	BA 5105	**Prerequisite(s)**	BA 5401
Course Description	Building upon the concepts already laid down in its pre-requisite, financial management helps students in exploring the depths of the relatively complex aspects of the financial world, with prime focus on the present value and opportunity cost of capital. This course covers topics such as nature, scope and function of financial decision areas, objectives of financial management, financial forecasting, working capital management, valuation of stocks, valuation of fixed income securities, project cash flow analysis, capital budgeting and decision making, determination of the required rate of return via asset pricing models, dividend policy, debt policy, introduction to financial risk management and derivatives and role of financial markets in Pakistan.		
Equivalent Course(s)	BA 3601, AF 4702		

Course Name	Strategic Marketing	**Credit Hours**	**3** (3,0)
Course Code	BA 5203	**Prerequisite(s)**	
		For MBA 72	BA 5106
		For MBA 36	None
Course Description	This course addresses topics such as business and marketing strategies, business strategy and competitive advantage, marketing situation analysis, market segmentation, marketing target and positioning strategy, product portfolio strategy, price strategy, promotion strategy, marketing strategy implementation and control. The focus is on the analysis and decision making process from strategic point of view. Additionally, understanding of how marketing interacts with other levels of strategy and integrate with all the other departments within the organization.		
Equivalent Course(s)	None		

1.2.1 Master of Business Administration (MBA)

Course Name	Research Project-1	**Credit Hours**	(**3**,0)
Course Code	BA 5508	**Prerequisite(s)**	BA 5501

Course Description

Part 1a: In Research Project students are required to work in teams on a specific industry challenge faced by a company. The project work usually involves carrying out research and/or performing sound strategic analysis for identifying solutions to the problem. The objectives of this project work are to: enhance the practical side of the learning process, internalize managerial concepts, and develop creative and applicable solutions. It mainly covers parts of Chapter 1: Introduction, Chapter 2: Literature Review and Chapter 3: Methodology (Proposed).

Part 2: *For students completing the project in one semester, and continuing another project in next semester.* In Research Project, students are required to work in teams on a specific industry challenge faced by a company. The project work usually involves carrying out research and/or performing sound strategic analysis for identifying solutions to the problem. The objectives of this project work are to: enhance the practical side of the learning process, internalize managerial concepts, and develop creative and applicable solutions. Students cover the areas of activities and methodology, like Overall Strategy Analysis of the company, data collection & risk Management tools and analysis, and finally conclude whether or not it is a viable business venture (or a viable business/strategic path for the client company to explain why the company should or should not pursue the business venture or the path under investigation). It mainly covers parts of Chapter 1: Introduction, Chapter 2: Literature Review and Chapter 3: Methodology, Chapter 4: Results and Chapter 5: Discussion and Conclusion.

Equivalent Course(s) BA 5507

Course Name	Thesis-1	**Credit Hours**	**(3,0)**
Course Code	BA 5507	**Prerequisite(s)**	BA 5501

Course Description

Thesis is the application of the theory and concepts learned across various courses in MBA program. It is an individual project to demonstrate the understanding of interdisciplinary knowledge and soft skills. It is based on identifying and solving a problem from any one specific field of business e.g. Management, Marketing, Finance, or Human Resource Management. It consists of understanding the real life business and industry problem, formulating the research questions, identifying appropriate methodology to answer the research questions, collecting and analyzing data from the field, and reporting the findings, by using the scientific methods of research. It mainly covers parts of Chapter 1: Introduction, Chapter 2: Literature Review and Chapter 3: Methodology (Proposed).

Equivalent Course(s) BA 5508

1.2.1 Master of Business Administration (MBA)

Course Name	Strategic Management	**Credit Hours**	**3** (3,0)
Course Code	BA 5104	**Prerequisite(s)**	
		For MBA 72	BA 5205, BA 5105, BA 5106
		For MBA 36	None

Course Description

This course covers various aspects of strategic management, information inputs, concepts of mission and objectives, strategy formulation, action plan choice, strategy selection and evaluation, function strategy evaluation, strategy implementation and strategic control.

Equivalent Course(s) None

Course Name	Strategic Finance	**Credit Hours**	**3** (3,0)
Course Code	BA 5208	**Prerequisite(s)**	
		For MBA 72	BA 5105
		For MBA 36	None

Course Description

This is an advanced course in finance that focuses upon the linkages that exist between corporate strategy and objectives, financial policy and financing strategies, corporate governance, and the creation and allocation of wealth. It also discusses the appropriate tools that can be applied to structuring and managing the business and financial affairs of a firm under varying conditions.

Equivalent Course(s) None

Course Name	Research Project-II	**Credit Hours**	**(3,0)**
Course Code	BA 5608	**Prerequisite(s)**	BA 5508

Course Description

Part 1b: Students cover the areas of activities and methodology, like Overall Strategy.

Analysis of the company, data collection & risk Management tools and analysis, and finally conclude whether or not it is a viable business venture (or a viable business/strategic path for the client company to explain why the company should or should not pursue the business venture or the path under investigation). It mainly covers parts of Chapter 3: Methodology (concluding), Chapter 4: Results and Chapter 5: Discussion and Conclusion.

For students completing the project in one semester. They will take another Research Project on the same lines as described in RP-I Part-2.

Equivalent Course(s) BA 5607

1.2.1 Master of Business Administration (MBA)

Course Name	Thesis 2	**Credit Hours**	**(3,0)**
Course Code	BA 5607	**Prerequisite(s)**	BA 5507

Course Description

This final part II of Thesis describes alternative models of study, and then applies the concepts in those models to understand the gap analysis, enlightening on the procedure of data collection and analysis, and finally concluding and giving future research directions. It covers parts of Chapter 3: Methodology (concluding), Chapter 4: Results (Business Project 2), Chapter 5: Discussion and Conclusion (Business Project 2).

Equivalent Course(s)

BA 5608

1.2 Masters and PhD

1.2.3 Master in Project Management (MPM)

Master in Project Management is designed to enable individuals to manage complex projects of today through modern project management approaches. MPM is a one-year evening program comprising 30 credit hours spread over two semesters.

Students enrolled in the Master in Project Management (MPM) program are required to complete 30 credit hours within four (4) years. The breakup of the courses is as follows:

- *7 Compulsory Courses (21 Credit Hours)*
- *2 Elective Courses[07] (6 Credit Hours)*
- *1 Compulsory Project (3 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
PM 5102	Fundamentals of Project Management	73
PM 5104	Cost and Financial Management for Project Management	73
PM 5105	Project Scope	73
PM 5107	IT Tools for Project Management	74
PM 5201	Project Scheduling, Planning and Time Management	74
	Spring Semester	
PM 5301	Project Quality Management	74
PM 5351	Project Risk Management	75
PM 5209	Project	75
PM 5xxx	Elective-I	-
PM 5xxx	Elective-II	-

All courses may not be offered every year. Alternative courses may be substituted as and when required.

07- List of Electives is given in Appendix B.

1.2.3 Master in Project Management (MPM)

Compulsory Courses

Course Name	Fundamentals of Project Management	**Credit Hours**	**3** (3,0)
Course Code	PM 5102	**Prerequisite(s)**	None

Course Description

This introductory course provides basic knowledge regarding; organization, planning, and controlling of projects, and practical knowledge on managing project scope, schedule, and resources. It includes various topics like: project life cycle, work break-down structure and Gantt charts, network diagrams, scheduling techniques, and resource allocation decisions. Theoretical concepts are supplemented through practical team projects and tutorials using project management software. The purpose of this course is to familiarize students with all terms and processes of project management and to let them have an enriched flavor of working in teams.

Equivalent Course(s) None

Course Name	Cost and Financial Management for Project Management	**Credit Hours**	**3** (3,0)
Course Code	PM 5104	**Prerequisite(s)**	None

Course Description

This course is intended to provide the general approaches to cost management, such as the methods used to estimate costs, preparing budgets and controlling /monitoring a project's finances. It will help to understand the interrelationship of various cost control concepts and possible responses a project management team might make if a project is falling behind schedule or overrunning its budget in real time. Course would further introduce the concept of project finance, which includes financing of projects based upon the projected cash flows of the project. It helps in understanding the strategic and technical components of project finance. Strategic elements of project financing include an understanding of project screening, value-for-money analysis, and risk mitigation and allocation. Technical elements of project financing include an understanding of the data and relevant assumptions, sensitivity analyses, tariffs, projecting cash flow, NPV & IRR returns, and cost of capital–all critical in building and interpreting the actual financial model.

Equivalent Course(s) None

Course Name	Project Scope	**Credit Hours**	**3** (3,0)
Course Code	PM 5105	**Prerequisite(s)**	None

Course Description

This course will provide participants with the skills and knowledge required to gather requirements, accurately define project scope, create a Work Breakdown Structure (WBS) that details all work components, and learn the elements involved in verifying and controlling scope. Scope Management techniques allow project managers and supervisors to allocate just the right amount of work necessary to complete a project successfully.

Equivalent Course(s) None

1.2.3 Master in Project Management (MPM)

Course Name	IT Tools for Project Management	**Credit Hours**	**3** (3,0)
Course Code	PM 5107	**Prerequisite(s)**	None

Course Description

The role and vitality of present and future project managers significantly depends on how they are able to handle and use the contemporary technological tools available around them for effective project planning and execution. As such the use of IT enabled platforms becomes imperative and gaining hands on experience on both Stand Alone and Server Based Project Management applications is a must. This course addresses this important aspect of Project Management (PM) by imparting HANDS-ON trainings of the participants on the latest available IT platforms through interactive discussions and realistic scenario building.

Equivalent Course(s) None

Course Name	Project Scheduling, Planning and Time Management	**Credit Hours**	**3** (3,0)
Course Code	PM 5201	**Prerequisite(s)**	None

Course Description

This course utilizes PMI's industry standard for the schedule management process and the Microsoft Project Scheduling Application which can be applied immediately to real-life projects. The course begins with the process of planning and developing of the right size schedule and making sure that it aligns with the current Work Breakdown Structure (WBS). By utilizing the Precedence Diagramming Method (PDM) the learners are able to develop the activity list, apply activity sequencing methodology, perform activity duration estimating with risk infusion, and even perform schedule optimization using Critical Path Methodology (CPM). The course also provides different techniques to evaluate impact of time delays of different activities through Project Evaluation and Review Technique (PERT).

Equivalent Course(s) None

Course Name	Project Quality Management	**Credit Hours**	**3** (3,0)
Course Code	PM 5301	**Prerequisite(s)**	None

Course Description

The course aims to give a broad understanding of various concepts and techniques used in project quality management such as quality concept in project management, quality planning, tools of quality management, quality assurance, quality monitoring and control, quality partnership, and customer satisfaction indices. The course also equips the students regarding different quality standards like, ISO 9000:2008, and six-sigma. In addition, the course covers quality implementation and review techniques in project management with practical approaches to project quality planning, project quality assurance, continuous quality improvement and project performance measurement through various quality metrics.

Equivalent Course(s) None

1.2.3 Master in Project Management (MPM)

Course Name	Project Risk Management	**Credit Hours**	**3** (3,0)
Course Code	PM 5351	**Prerequisite(s)**	None

Course Description

This course utilizes PMIs standards for Project Risk Management. The course is designed in a way that it enhances expertise and competency of Project Professionals in assessing and identifying project risks, mitigating threats and capitalizing on opportunities, while still possessing a core knowledge and practical application in all areas of project management.

Equivalent Course(s)

None

Course Name	Project	**Credit Hours**	**3** (3,0)
Course Code	PM 5209	**Prerequisite(s)**	None

Course Description

This course is based upon industry-linked project that emphasizes to utilize concepts, theories, tools, and techniques learned in various courses of project management. The course is based on teams that undertake a real-life project from the industry, government or non-governmental organizations. Major emphasis is placed on utilization of project management skills and tools learned in the classroom, communication skills, technical writing, and regular interaction with industry representatives along with the course facilitator. The overall goal of the course is to experience modern project management practices and develop interpersonal skills to handle real projects under real constraints by realizing the contextual information.

Equivalent Course(s)

None

1.2.4 Executive Master of Business Administration (EMBA)

Students enrolled in the Executive Master of Business Administration (EMBA) program are required to complete 20 Course, 01 Business Project and 01 Research Project within four (4) years. The break-up of 20 courses & projects (66 credit hours) is as follows:

- *17 Compulsory Courses (51 Credit Hours)*
- *3 Elective[08] Courses (9 Credit Hours)*
- *1 Business Project (3 Credit Hours)*
- *1 Research Project (3 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
BE 5101	Accounting for Business	77
BE 5102	Business Management	77
BE 5103	Contemporary Marketing	77
BE 5104	Managerial Communication	78
BE 5105	Quantitative Analysis for Decision Making	78
	Spring Semester	
BE 5201	Applied Research Methods	78
BE 5202	Business Finance	79
BE 5203	Managerial Accounting and Control	79
BE 5204	Managerial Economics	79
BE 5205	Marketing Management	79
BE 5206	Organizational Behavior	80
	Second Year	
	Fall Semester	
BE 5301	Financial Management	80
BE 5302	Human Resource Management	80
BE 5303	Operations and Supply Chain Management	81
BE 5304	Business Project	81
BE 5xxx	Elective-I (Marketing, HR, Finance and Supply Chain)	-
	Spring Semester	
BE 5401	Entrepreneurship and Family Businesses	81
BE 5402	Ethics and Corporate Governance	82
BE 5403	Strategic Management	82
BE 5409	Research Project	82
BE 5xxx	Elective-II (Marketing, HR, Finance and Supply Chain)	-
BE 5xxx	Elective-III (Marketing, HR, Finance and Supply Chain)	-

All courses may not be offered every year. Alternate courses may be substituted as and when required.

08- List of Electives is given in Appendix B.

1.2.4 Executive Master of Business Administration (EMBA)

Compulsory Courses

Course Name	Accounting for Business	**Credit Hours**	**3** (3,0)
Course Code	BE 5101	**Prerequisite(s)**	None

Course Description

This course covers the basic accounting principles and concepts of financial accounting. The topics include accounting for merchandise business, classified balance sheet, simple and multiple steps income statement, design of accounting system, accounts receivable, notes receivable, inventories, cost of goods sold, liabilities, and stockholders equity.

Equivalent Course(s) BA 5301

Course Name	Business Management	**Credit Hours**	**3** (3,0)
Course Code	BE 5102	**Prerequisite(s)**	None

Course Description

This course introduces the basic concepts of management, evolution and emergence of management thought, management function, planning concepts, decision-making, organizing, staffing, leading, controlling, and future perspective of management and society. Also, the course introduces contemporary ethical issues faced by the business community.

Equivalent Course(s) BA 5419

Course Name	Contemporary Marketing	**Credit Hours**	**3** (3,0)
Course Code	BE 5103	**Prerequisite(s)**	

Course Description

This course is designed for professionals to share the current and future development in the field of marketing and to bring students at a level where they will be able to apply experiential learning, problem solving, analytical, and decision-making skills to real situations. This course promotes the capacity to take initiatives and develop independence of thought in a supportive framework-qualities universally identified as being essential to industrial and commercial needs.

Equivalent Course(s) BA 5404

1.2.4 Executive Master of Business Administration (EMBA)

Course Name	Managerial Communication	**Credit Hours**	**3** (3,0)
Course Code	BE 5104	**Prerequisite(s)**	None

Course Description

This course is designed to develop the application of written, oral, and interpersonal communication theory in the business management environment. Areas of emphasis include the role of communication in contemporary organizations, considerations of message production and reception, internal versus external audiences, communicating change, intercultural communication, and ethics.

Equivalent Course(s) BA 5418

Course Name	Quantitative Analysis for Decision Making	**Credit Hours**	**3** (3,0)
Course Code	BE 5105	**Prerequisite(s)**	None

Course Description

The fundamental aim of this course is to develop the students' ability to use quantitative techniques for decision making. This course contains the tools of statistical analysis, both descriptive and inferential, to make decisions about parameters of a population. The technique of testing hypothesis would help to make decision concerning selection between alternatives. The regression analysis and the analysis of variance included in the outline helps in precise prediction, as well as, formulation of strategies objectively. Moreover, linear programming technique helps in the optimum allocation of resources.

Equivalent Course(s) BA 5502

Course Name	Applied Research Methods	**Credit Hours**	**3** (3,0)
Course Code	BE 5201	**Prerequisite(s)**	None

Course Description

This course equips students with the essential tools of research which forms the basis of sound decision-making. Through an applied approach using term report supplemented by classroom discussions and presentations, students gain knowledge of converting a business issue into a research problem; and applying the most appropriate methodology to solve this problem. The course provides an overview of applied research methodology and statistics. The general aims are to provide: a) an advanced understanding of research methods and data analysis, b) enhanced research literacy, and c) a greater understanding of the way in which research methodology and statistics are interwoven with theory and the practice.

Equivalent Course(s) BA 5501

1.2.4 Executive Master of Business Administration (EMBA)

Course Name	Business Finance	**Credit Hours**	**3** (3,0)
Course Code	BE 5202	**Prerequisite(s)**	BE 417

Course Description

This course covers the concepts of business environment, forms of business organization, overview of financial environment, cost markets, institutions and interest rates, analyses of financial statements, time value of money, sources of short-term and long-term finance, break even analysis, working capital management, valuation of financial securities (debt/equity) and introduction to capital budgeting.

Equivalent Course(s) BA 5401

Course Name	Managerial Accounting and Control	**Credit Hours**	**3** (3,0)
Course Code	BE 5203	**Prerequisite(s)**	BE 417, BE 414

Course Description

This course includes the study of management accounting for internal reporting and decision making. The course introduces a business management approach for the development and use of accounting information. Major topics include cost behavior, cost analysis, profit planning, and control measures.

Equivalent Course(s) BA 5411

Course Name	Managerial Economics	**Credit Hours**	**3** (3,0)
Course Code	BE 5204	**Prerequisite(s)**	None

Course Description

Students focus on the application of economic models and rationale choice to business decision making. Topics include an overview of managerial economics; demand and supply; costs of production and the organization of the firm; market structure and pricing and output decisions; game theory and pricing strategies; and the economics of information and the role of government in the marketplace.

Equivalent Course(s) None

Course Name	Marketing Management	**Credit Hours**	**3** (3,0)
Course Code	BE 5205	**Prerequisite(s)**	BE 5103

Course Description

This course introduces the concept of customer and market-driven management. This course covers organizations' external and internal environment, strengths, weaknesses, opportunities and threats, marketing information system, buyer behavior analysis, segmenting, targeting and positioning strategies, product and pricing strategies, an in-depth study of strategy building by organizations with the help of case studies and a practical, hands-on learning experience of marketing management through close observations of marketing management at different levels in marketing channels.

Equivalent Course(s) BA 5106

1.2.4 Executive Master of Business Administration (EMBA)

Course Name	Organizational Behavior	**Credit Hours**	**3** (3,0)
Course Code	BE 5206	**Prerequisite(s)**	BE 5102

Course Description

This course covers the subject matter on three levels: individual, group and interpersonal, and organizational. At the individual level, the focus is to examine individual behavior and differences, learning, perception, personality, motivation, and stress. The group/ interpersonal level covers group and inter-group behavior, creativity, and team decision-making. It also includes power, conflict, leadership, and communication. At the organizational level, it reviews the basics of organizational culture, organizational change and development, structure, design, employment relationship, and career management.

Equivalent Course(s) BA 5207

Course Name	Financial Management	**Credit Hours**	**3** (3,0)
Course Code	BE 5301	**Prerequisite(s)**	BE 5202

Course Description

Building upon the concepts already laid down in its prerequisite, financial management helps students in exploring the depths of the relatively complex aspects of the financial world, with prime focus on the present value and opportunity cost of capital. This course covers topics such as nature, scope and function of financial decision areas, objectives of financial management, financial forecasting, working capital management, valuation of stocks, valuation of fixed income securities, project cash flow analysis, capital budgeting and decision making, determination of the required rate of return via asset pricing models, dividend policy, debt policy, introduction to financial risk management and derivatives and role of financial markets in Pakistan.

Equivalent Course(s) BA 5105

Course Name	Human Resource Management	**Credit Hours**	**3** (3,0)
Course Code	BE 5302	**Prerequisite(s)**	BE 5206

Course Description

This course examines the role of the human resource professional as a strategic partner in managing contemporary organizations. The course introduces concepts, issues and practices in Human Resource Management (HRM) such as Human Resource (HR) planning, job design and analysis, recruitment and selection, training and development, performance appraisal, compensation and benefit management, career planning and development, employee relations, appraising the implications of legal and global environments and analyzing the current issues (such as diversity training, sexual harassment policies, and rising benefit costs), and best practices of employers of choice.

Equivalent Course(s) BA 5205

1.2.4 Executive Master of Business Administration (EMBA)

Course Name	Operations and Supply Chain Management	**Credit Hours**	**3** (3,0)
Course Code	BE 5303	**Prerequisite(s)**	BE 5102

Course Description

This course serves as the macro perspective for operations. Students' learning is rounded in this course where they see how Strategy, Operations, Marketing, Sales, Finance, IT and Accounting work together to add to Operational Efficiency, Customer Intimacy, and Product Innovation for companies. Understanding key supply chain foundations is crucial to any company's success and profitability. In this class students learn supply chain and its significant impact on all aspects of business while gaining an understanding of the synchronism and synergies of all its components.

Equivalent Course(s) BA 5214

Course Name	Business Project	**Credit Hours**	**3** (3,0)
Course Code	BE 5309	**Prerequisite(s)**	BE 5201

Course Description

This course is designed to ensure that the students demonstrate their understanding of developing a business strategy for the existing or new business organization by utilizing the theories, concepts, and knowledge learnt during the whole program. It also ensures students' ability to critically evaluate the process of business innovation with particular reference to the groups work and experience and to generate business ideas, to screen these ideas, and to develop a realistic plan for development and implementation of a selected idea.

Equivalent Course(s) None

Course Name	Entrepreneurship and Family Businesses	**Credit Hours**	**3** (3,0)
Course Code	BE 5401	**Prerequisite(s)**	BE 5103, BE 5205

Course Description

This course is designed to teach the conceptual foundations of entrepreneurship, strategic areas of business, entrepreneurial perspective, process, ventures, practices, characteristics, entrepreneurship and new free enterprise, product and service concepts, marketing and new venture development, entrepreneurial team and business formation, and applying various tools and analytical techniques to the new venture creation process in domestic and international settings.

Equivalent Course(s) BA 5406

New

1.2.4 Executive Master of Business Administration (EMBA)

Course Name	Ethics and Corporate Governance	**Credit Hours**	**3** (3,0)
Course Code	BE 5402	**Prerequisite(s)**	BE 5103

Course Description

This course is designed so students can gain knowledge about the area of Corporate Governance & Business Ethics from different perspectives and its application. To understand and apply the concepts learned from various models to different corporate environment and to understand the mechanisms of controls, accountability and compliance. To provide effective management and decision-making skills.

Equivalent Course(s) None

Course Name	Strategic Management	**Credit Hours**	**3** (3,0)
Course Code	BE 5403	**Prerequisite(s)**	BE 5202, BE 55302 BE 5102

Course Description

This course covers strategic management, information inputs, concepts of mission and objectives, strategy formulation, action plan choice, strategies selection and evaluation, function strategy evaluation, strategy implementation, and strategic control.

Equivalent Course(s) BA 5104

Course Name	Research Project	**Credit Hours**	**3** (3,0)
Course Code	BE 5409	**Prerequisite(s)**	BE 418

Course Description

For this course project the research has to be based on scientific study in a specialized field of business, such as Marketing, Finance, Human Resource Management, Management Information System etc. The course consists of understanding the real-life business problems and formulating the research techniques to solve them by using the scientific tools. It also helps to comprehend the research tools along with their application in specific areas.

Equivalent Course(s) None

1.2.5 Master of Science in Project Management (MSPM)

The Master of Science in Project Management (MSPM) is a 1.5 - 2 years program having two streams i.e. Course Work Based Stream and Research Based Stream. Students enrolled in the Master of Science in Project Management (MSPM) program are required to complete 30 credit hours within four (4) years.

The breakup of the courses as per specific Stream students is provided below:

Course Work based Stream

- *4 Core Courses (12 Credit Hours)*
- *6 Elective Courses[9] (18 Credit Hours)*

Research based Stream

- *4 Core Courses (12 Credit Hours)*
- *4 Elective Courses[10] (12 Credit Hours)*
- *2 Independent Research Study/1 Thesis (6 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
MP 5107	Fundamentals of Project Management	84
MP 5105	Advance Project Management	84
MP 5103	Research Methodology	84
MP 5xxx	Elective-I	-
	Spring Semester	
MP 5202	Quantitative Tools for Research	85
MP 5xxx	Elective-II	-
MP 5xxx	Elective-III	-
MP 5xxx	Elective-IV	-
	Second Year	
	Fall Semester	
MP 5xxx	Thesis-I*/Independent Research Study–I*/Elective-V	-
MP 5xxx	Independent Research Study-II/Elective-VI	-
	Spring Semester	
MP 5xxx	Thesis-II	-

* * Thesis to be registered in two parts while Independent Research Study-I and Independent Research Study-II can be opted in one semester by Research Based Stream.

All courses may not be offered every year. Alternative courses may be substituted as and when required. Thesis may be substituted by the electives.

09- List of Electives is given in Appendix B.
10- List of Electives is given in Appendix B.

1.2.5 Master of Science in Management Sciences (MSPM)

Compulsory Courses

Course Name	Fundamentals of Project Management	**Credit Hours**	**3** (3,0)
Course Code	MP 5107	**Prerequisite(s)**	None

Course Description

This is an introductory course that will provide the broad knowledge regarding basic concepts and techniques used in Project Management. It will provide practical knowledge on managing project scope, schedule and resources. It includes various topics like: Project life cycle, work breakdown structure and Gantt charts, network diagrams, scheduling techniques and resource allocation decisions.

Equivalent Course(s) None

Course Name	Advanced Project Management	**Credit Hours**	**3** (3,0)
Course Code	MP 5105	**Prerequisite(s)**	None

Course Description

This course would cover broad knowledge regarding concepts in Project Management and techniques used in project management ranging from Change Management in Projects, Project Risk, Risk Analysis, Procurement, Project Human Resource, Communication, Stockholder Management, and Integration Management. The course includes a number of case studies to integrate the broad areas and emphasize application in project management.

Equivalent Course(s) None

Course Name	Research Methodology	**Credit Hours**	**3** (3,0)
Course Code	MP 5103	**Prerequisite(s)**	None

Course Description

This course familiarizes participants with a range of approaches used in the management and project management research, with an emphasis on approaches commonly used in practical settings. The advantages and limitations of different research approaches are examined, as well as their applicability in different organizational contexts. Experience is provided in the; design of research studies; analysis and interpretation of data; and report writing and presentation. Participants acquire skills which will be useful in doing academic research independently in their chosen area of interest.

Equivalent Course(s) MS 5137

1.2.5 Master of Science in Management Sciences (MSPM)

Course Name	Quantitative Tools for Research	**Credit Hours**	**3** (3,0)
Course Code	MP 5202	**Prerequisite(s)**	None

Course Description

Quantitative Tools for Research course is designed to introduce students to some of the statistical and mathematical techniques that are widely used in empirical work in management and other related disciplines. It covers the basics of estimation and inference in the context of the single-equation linear regression model and simultaneous equation models.

Equivalent Course(s) MS 5204

1.2.6 Master of Science in Management Sciences (MSMS)

The Master of Science in Management Sciences (MSMS) is a 1.5 - 2 years program having two streams i.e. Course Work Based Stream and Research Based Stream. Students enrolled in the either stream of MSMS program are required to complete a total of 30 credit hours within four (4) years.

Course Based Stream:

The following is the break-up of the 30 credit hour courses:

- *6 Compulsory Courses (18 Credit Hours)*
- *4 Elective[11] Courses (12 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
MS 5137	Research Methods and Techniques	88
MS 5132	Applied Strategic Management	88
MS 5238	Strategic Human Resource Development	88
MS 5104	Strategic Marketing Decision	89
	Spring Semester	
MS 5204	Quantitative Tools for Research	89
MS 5318	Strategic Finance	89
MS 5xxx	Elective-I	-
MS 5xxx	Elective-II	-
	Second Year	
	Fall Semester	
MS 5xxx	Electives-III	-
MS 5xxx	Electives-IV	-

11- List of Electives is given in Appendix B.

1.2.6 Master of Science in Management Sciences (MSMS)

Research Based Stream:

The following is the break-up of the 30 credit hour courses:

- *6 Compulsory Courses (18 Credit Hours)*
- *2 Elective[12] Courses (6 Credit Hours)*
- *2 Independent Research Studies (IRS)/1 Thesis (6 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
MS 5137	Research Methods and Techniques	88
MS 5132	Applied Strategic Management	88
MS 5238	Strategic Human Resource Development	88
MS 5104	Strategic Marketing Decisions	89
	Spring Semester	
MS 5204	Quantitative Tools for Research	89
MS 5318	Strategic Finance	89
MS 5xxx	Elective-I	-
MS 5xxx	Elective-II	-
	Second Year	
	Fall Semester	
MS 5119	Independent Research Study I / Thesis (Part I)	-
MS 5219	Independent Research Study II	-
MS 5xxx	Thesis (Part II) If any	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

For both streams Electives can be taken from any of the following specializations:

- *Finance*
- *Marketing*
- *Human Resource Management*

Students cannot register in Independent Research Study (IRS) OR Thesis without completing six compulsory courses.

12- List of Electives is given in Appendix B.

1.2.6 Master of Science in Management Sciences (MSMS)

Compulsory Courses

Course Name	Research Methods and Techniques	**Credit Hours**	**3** (3,0)
Course Code	MS 5137	**Prerequisite(s)**	None
Course Description	This course provides the understanding of advanced research methods and techniques like: writing quality research proposal, identification of research design and framework development, identifying sources of secondary data, writing scientific literature review, development of primary tools of data collection, qualitative and quantitative analysis, reporting and presenting the research. It also equips the students to write quality research papers for national and international conferences and journals.		
Equivalent Course(s)	BA 5501, MP 5103, MS 5201 MS 5239		

Course Name	Applied Strategic Management	**Credit Hours**	**3** (3,0)
Course Code	MS 5132	**Prerequisite(s)**	None
Course Description	This Course is based on analysis of multi-level issues in Strategic Management of the organizations. It focuses to highlight approaches applied by the organizations to formulate and implement strategies. This course aims at providing insight for understanding different situations and circumstances wherein strategies are supposed to be formulated and executed with care to benefit the stakeholders at large.		
Equivalent Course(s)	BA 5104		

Course Name	Strategic Human Resource Development	**Credit Hours**	**3** (3,0)
Course Code	MS 5238	**Prerequisite(s)**	None
Course Description	This course builds on basic & advanced concepts and Overview of the theoretical frameworks and practices related to human resource development in organizations. The major objective of the course is to explain and demonstrate the contribution of HRD in an organization and enable students to develop an ability to decide learning and training needs and have competence in the design and delivery of learning programs. Organizations are made up of people: their knowledge, skills, attitudes, and interconnections. In order to survive and thrive, organizations need to facilitate the growth of all of these as part of an HRD strategy. Human Resource Development (HRD) is a key activity that systematically leads to the growth and development of people in organizations, and makes organizations more effective.		
Equivalent Course(s)	BA 5601		

1.2.6 Master of Science in Management Sciences (MSMS)

Course Name	Strategic Marketing Decision	**Credit Hours**	**3** (3,0)
Course Code	MS 5104	**Prerequisite(s)**	None

Course Description

Strategic Marketing Decisions is an advance level Marketing course. The aim of the course is to develop a strategic thinking approach to marketing. It aims to help students understand how companies compete using marketing strategy and its correlates focusing on achieving a competitive advantage for the firm by creating customer value and leveraging the firm's marketing resources in the most efficient and effective manners. It builds upon the basic concepts of Marketing, which the students have learned in their previous marketing courses and to prepare students to grasp the complex issues of marketing.

Equivalent Course(s) None

Course Name	Quantitative Tools for Research	**Credit Hours**	**3** (3,0)
Course Code	MS 5204	**Prerequisite(s)**	None

Course Description

This course enables the students to know the scientific approach to decision making when solving research problems for management sciences. Several methods are introduced in applying statistics to solve management problems quantitatively. Therefore, main focus of this course is on building a better understanding of the statistical tools for displaying and analyzing business data. The course covers a variety of topics from the description and visualization of data, to testing differences between samples and finally to building models to identify the key factors that are important in solving/addressing a research problem. The statistical computations are cumbersome by hand, so most of the models are computed using SPSS, Smart PLS, E-Views and Microsoft Excel.

Equivalent Course(s) BA 4792, SS 5207, MS 6212, MP 5202, ELM5103

Course Name	Strategic Finance	**Credit Hours**	**3** (3,0)
Course Code	MS 5318	**Prerequisite(s)**	None

Course Description

This course is designed to equip students with the skills that would be expected from a finance manager responsible for the finance function of a business. The course starts by introducing the role and purpose of the financial management function within a business. Before looking at the three key financial management decisions of investing, financing, and dividend policy, the syllabus explores the economic environment in which such decisions are made. The next section of the syllabus is the introduction of investing decisions. This is done in two stages, investment in working capital and its management. The next area introduced is financing decisions. This section of the syllabus starts by examining the various sources of business finance, including dividend policy and how much finance can be raised from within the business. It also looks at the cost of capital and other factors that influence the choice of the type of capital a business will raise.

Equivalent Course(s) BA 5208

1.2.7 Doctor of Philosophy in Management Sciences (PhD MS)

Students enrolled in Doctor of Philosophy in Management Sciences (PhD MS) program are required to complete 48 credit hours within 3 to 8 years. Following is the breakup of 48 credit hours.

- *2 compulsory courses (6 credit hours)*
- *3 Elective[13] course (9 credit hours)*
- *1 Independent Research Study (3 credit hours)*
- *1 Dissertation (30 credit hours)*

  - ⇨ *Students cannot register in IRS before completing all compulsory courses, passing GAT-Subject and maintaining minimum CGPA requirement.*
  - ⇨ *Dissertation of 30 Credit Hours is Compulsory.*
  - ⇨ *Registration in Dissertation is allowed after passing Comprehensive Examination.*
  - ⇨ *All the requirements of HEC pertaining to PhD must be fulfilled these are;*

- o *Passing GAT Subject with minimum 60%.*
- o *Maintaining minimum CGPA requirement for each course and for entire program.*
- o *Passing Comprehensive examination to establish the PhD candidacy within two years from the date of admission (maximum 2 attempts allowed).*
- o *Publishing one Research Paper from the thesis in HEC recognized journal before the completion of 30 Credit Hours Dissertation.*
- o *Elective Courses will be selected from the specialized area of Marketing, Finance and Human Resource Management.*
- o *Maximum Course Load for each Semester is 9 credit hours.*
- o *Time duration for PhD is Minimum 3 years and Maximum 8 years.*
- o *All General guidelines mentioned in DOCTORAL DEGREE PROGRAMS are applicable to PhD-Management Science.*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
MS 6106	Advanced Research Methods and Techniques	92
MS 6216	Advanced Quantitative Tools for Research	92
MS 6xxx	Elective-I	-
	Spring Semester	
MS 6xxx	Elective-II	-
MS 6xxx	Elective-III	-
MS 6221	Independent Research Study	-

13- List of Electives is given in Appendix B.

1.2.7 Doctor of Philosophy in Management Sciences (PhD MS)

Second Year		
Fall Semester		
MS 6109	Dissertation (Proposal)	-
Spring Semester		
MS 6209	Dissertation	-
Fall Semester		
MS 6309	Dissertation	-
Spring Semester		
MS 6409	Dissertation	-

All courses may not be offered every year. Alternate courses may be substituted as and when required

1.2.7 Doctor of Philosophy in Management Sciences (PhD MS)

Compulsory Courses

Course Name	Advanced Research Methods and Techniques	**Credit Hours**	**3** (3,0)
Course Code	MS 6106	**Prerequisite(s)**	MS 5137

Course Description

The Course enables student to understand the advance pillars of research methods and techniques like writing impact factor research paper, proposal writing, Book review, identification and development of research design, qualitative and quantitative analysis, reporting and presentation of results. The course also give students an orientation of latest research techniques like Multi Attribute Data Management and Compute-able General Equilibrium Modelling.

Equivalent Course(s) MS 6116

Course Name	Advanced Quantitative Tools for Research	**Credit Hours**	**3** (3,0)
Course Code	MS 6216	**Prerequisite(s)**	MS 5204

Course Description

This course is designed for PhD students and requires an understanding of quantitative tools for research. It covers advanced topics in quantitative research like: multivariate model building, multiple regression analysis, multiple discriminant analysis, MANOVA, ANCOVA, canonical correlations, factor analysis, cluster analysis, conjoint analysis, structured equation modelling. The emphasis of course is using advanced techniques for research with concept building and software application.

Equivalent Course(s) MS 6212

Department of Computer Science

2.0 Bachelor of Science

2.1.1 Bachelor of Science in Computer Science (BSCS)

The Bachelor of Science in Computer Science (BSCS) program is offered through a well-trained foreign qualified faculty. It consists of 41 courses (five-six courses per semester) with a total of 130 credit hours. BS (CS) Program is accredited by NCEAC. The maximum time to complete the degree is 7 years. The breakup of 41 courses is /as follow:

- *28 Compulsory Course (88 Credit Hours)*
- *4 University Electives[14] (12 Credit Hours)*
- *5 CS Electives[15] (15 Credit Hours)*
- *3 CS Supporting (9 Credit hours)*
- *2 Final Year Project (6 Credit Hours)*

Course Code	Course Title	Page #
First Year		
Fall Semester		
CSC 1108	Introduction to Computer Science	97
CSCL 1108	Lab : Introduction to Computer Science	-
CSC 1103	Fundamentals of Programming	97
CSCL 1103	Lab : Fundamentals of Programming	-
CSC 1102	English Composition and Comprehension	97
CSC 1101	Calculus and Analytical Geometry	98
CSC 1107	Applied Physics	98
CSCL 1107	Lab : Applied Physics	-
CSC 1109	Pakistan Studies	98
Spring Semester		
CSC 2103	Digital Logic Design	99
CSCL 2103	Lab : Digital Logic Design	-
CSC 1208	Object Oriented Programming Techniques	99
CSCL 1208	Lab : Object Oriented Programming Techniques	-
CSC 2101	Communication and Presentation Skills	99
CSC 1206	Probability and Statistics	100
CSC 1209	Islamic Studies / Humanities	100
Second Year		
Fall Semester		
CSC 2201	Computer Organization and Assembly Language	100
CSCL 2201	Lab : Computer Organization and Assembly Language	-0
CSC 2102	Data Structures and Algorithms	101
CSCL 2102	Lab : Data Structures and Algorithms	-
CSC 1201	Discrete Mathematical Structures	101
CSC xxxx	University Elective-1	-
CSC xxxx	CS Supporting-1	-

14- List of University Electives is given in Appendix B.
15- List of CS Electives is given in Appendix B.

2.1 Bachelor of Science in Computer Science (BSCS)

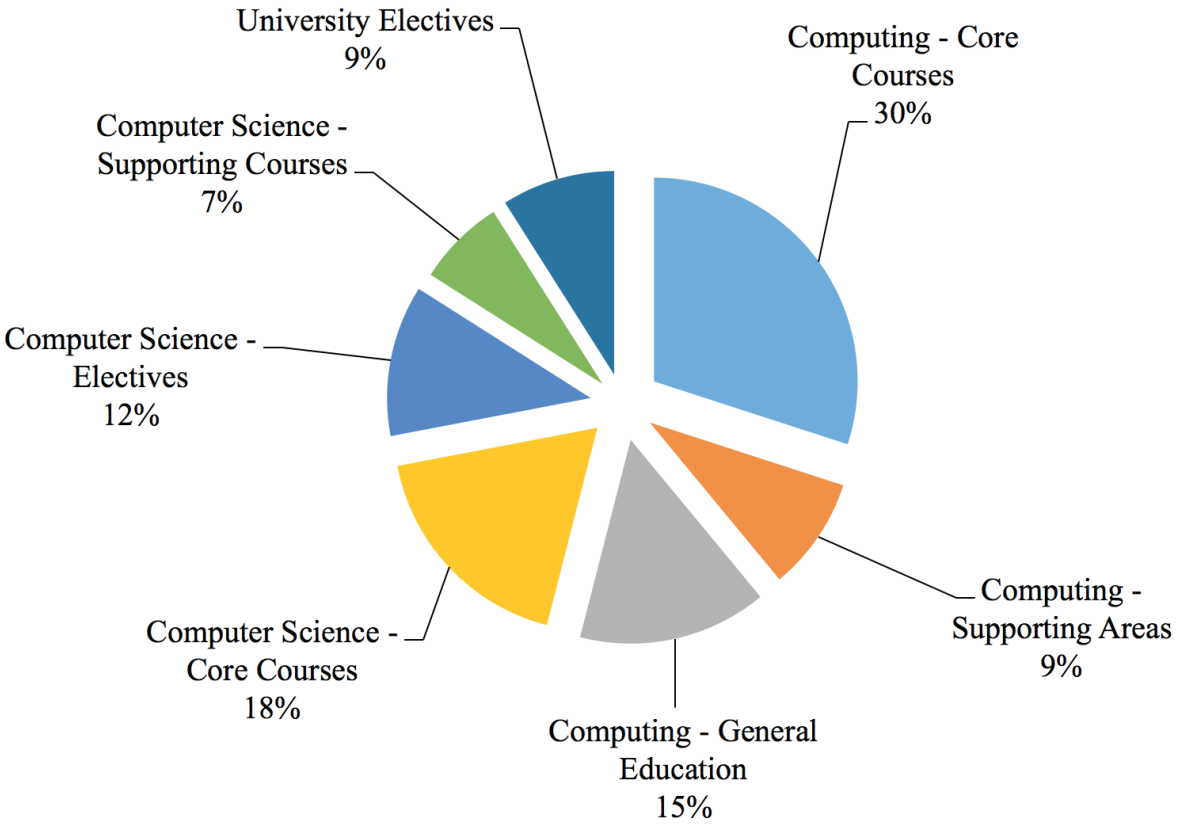
Course Code	Course Title	Page #
	Spring Semester	
CSC 3202	Design & Analysis of Algorithms	101
CSC 2204	Finite Automata Theory and Formal Languages	102
CSC 2203	Database Systems	102
CSCL 2203	Lab : Database Systems	-
CSC 2206	Linear Algebra	102
CSC xxxx	University Elective-2	-
	Third Year	
	Fall Semester	
CCSC 3201	Compiler Construction	102
CSC 2205	Operating Systems	103
CSCL 2205	Lab : Operating Systems	-
CSC 3109	Software Engineering	103
CSC xxxx	CS Supporting-2	-
CSC xxxx	CS Supporting-3	-
	Spring Semester	
CSC 4101	Artificial Intelligence	103
CSCL 4101	Lab : Artificial Intelligence	-
CSC 3205	Computer Networks and Data Communications	104
CSCL 3205	Lab: Computer Networks and Data Communications	-
CSC 1205	Technical and Business Writing	104
CSC 4xxx	CS Elective-1	-
CSC 4xxx	CS Elective-2	-
	Fourth Year	
	Fall Semester	
CSC 4102	Professional Practices	104
CSC 4105	Final Year Project-I	105
CSC 4106	Parallel & Distributed Computing	105
CSC 4xxx	CS Elective-3	-
CSC xxxx	University Elective-3	-
	Spring Semester	
CSC 4205	Final Year Project-II	105
CSC 4201	Information Security	106
CSC 4xxx	CS Elective-4	-
CSC 4xxx	CS Elective-5	-
CSC xxxx	University Elective-4	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.
*A CSC xxxx Mathematics deficiency course will be offered to those students who have limited mathematical background (if deemed necessary by relevant PM/HOD)

2.1.1 Bachelor of Science in Computer Science (BSCS)

DISTRIBUTION OF CREDIT HOURS

Course Group		Cr. Hrs.	%
Computing	Core Courses	39	30%
	Supporting Areas	12	9%
	General Education	19	15%
Computer Science	Core Courses	24	18%
	Electives	15	12%
	Supporting Courses	9	7%
University Electives		12	9%
Total		**130**	**100%**



2.1.1 Bachelor of Science in Computer Science (BSCS)

Compulsory Courses

Course Name	Introduction to Computer Science	**Credit Hours**	**3** (2,1)
Course Code	CSC 1108	**Prerequisite(s)**	None
Course Description	This course introduces fundamental computer concepts, including basic functions and operations of the computer. Course will cover topics that include identification of hardware components, computer software and architecture, operating system and network technologies, basic computer operations, internet and the world wide web, databases and information systems.		
Equivalent Course(s)	BA 1108, BA 1103, BIO 1104, AF 1102, EN 1102		

Course Name	Fundamentals of Programming	**Credit Hours**	**4** (3,1)
Course Code	CSC 1103	**Prerequisite(s)**	None
Course Description	This course is about learning the basics of programming languages. It provides Principles of Structured and Modular Programming and Overview of Structured Programming, and subsequently targets the development of coding abilities in a student. Later, it develops skills to identify errors, troubleshoot and finally, to analyze a C programming code. To do so, the following technical topics are covered: Constructs, Data Types; Basics of Input and Output, Selection and Decision (If, If-Else, Nested If-Else, Switch Statement and Condition Operator), Repetition (While and For Loop, Do-While Loops), Break Statement, Continue Statement, Control Structures, Functions, Arrays, Pointers, Records, Files (Input-Output), Testing & Debugging.		
Equivalent Course(s)	None		

Course Name	English Composition and Comprehension	**Credit Hours**	**3** (3,0)
Course Code	CSC 1102	**Prerequisite(s)**	None
Course Description	This course will provide students with the basic skills needed to organize, develop and deliver effective communication. It will also empower the students to determine the appropriate purpose, audience, and mode of communication based on the context. The course focuses on paragraph and essay writing, comprehension and reading as well as cause and effect, descriptive, comparative writing skills. The students will also be able to design their own CVs and cover letters which would help them in their future job search.		
Equivalent Course(s)	ME 1205, MD 1222, SS 2316, BIO 1211		

Course Name	Calculus and Analytical Geometry	**Credit Hours**	**3** (3,0)
Course Code	CSC 1101	**Prerequisite(s)**	None

Course Description

This course begins with a review of algebra and trigonometry; then the idea of limits and continuity is introduced. With the knowledge of limits and continuity the student develops the concept of the derivative and its applications. At the end, the student studies the anti-derivative of elementary functions and the applications of the definite integral in geometry, science, and engineering. Applicable toward graduation where program structure permits. Topics include (but are not limited to) the following: limits and continuity; definition of derivative: rate of change, slope; derivatives of polynomial and rational functions; the chain rule; implicit differentials; approximation by differentials; higher order derivatives; Rolle's Theorem: mean value theorem; applications of the derivative; anti-derivative; the definite integral; the fundamental theorem of calculus; area, volume, other applications of the integral; the calculus of the trigonometric functions; logarithmic and exponential functions and techniques of integration.

Equivalent Course(s) BA 2404, ME 1104

Course Name	Applied Physics	**Credit Hours**	**3** (2,1)
Course Code	CSC 1107	**Prerequisite(s)**	None

Course Description

The topics covered in this course include particle kinematics and dynamics; conservation of energy and linear momentum; rotational kinematics; rigid body dynamics; conservation of angular momentum; simple harmonic motion; the static and dynamics of fluids. This course also includes basic electronics concepts that help students to understand all essential electronics used for computing.

Equivalent Course(s) None

Course Name	Pakistan Studies	**Credit Hours**	**2** (2,1)
Course Code	CSC 1109	**Prerequisite(s)**	None

Course Description

Multicultural societies, historical background of Pakistan: Muslim society in Indo-Pakistan, the movement led by the societies, the downfall of Islamic society, the establishment of British Raj- causes and consequences. It also covers political evolution of Muslims in the twentieth century: Sir Syed Ahmed Khan; Muslim League; Nehru; Allama Iqbal: independence movement; Lahore Resolution; Pakistan culture and society, constitutional and administrative issues, Pakistan and its geo-political dimension, Pakistan and international affairs, and Pakistan and the challenges ahead.

Equivalent Course(s) ME 2306

Course Name	Digital Logic Design	**Credit Hours**	**4** (3,1)
Course Code	CSC 2103	**Prerequisite(s)**	CSC 1107

Course Description

This course teaches theoretical concepts, well supported through practical work, systematic synthesis of the applied techniques for the design of practical digital systems. Topics include; introduction to various numbering systems, various design techniques, minimization techniques for designing efficient combinational and sequential logic circuits, basic digital circuit building blocks, such as, decoders, multiplexers, shift registers, flip flops, etc. Modern methods of designing digital circuits; designing of autonomous and input-controlled counters & shift-registers and concept of finite state machine are also introduced.

Equivalent Course(s) None

Course Name	Object Oriented Programming Techniques	**Credit Hours**	**4** (3,1)
Course Code	CSC 1208	**Prerequisite(s)**	CSC 1103

Course Description

The Object oriented paradigm presents a conceptual and practical introduction to imperative and object oriented programming, exemplified by Java. Along with providing grounding in the use of Java, the course will cover general principles of programming in imperative and object oriented frameworks. In addition, the course would enable students to develop programs that support experimentation, simulation and exploration in other parts of the Information curriculum (e.g. the capacity to implement, test and observe a particular algorithm).

Equivalent Course(s) None

Course Name	Communication and Presentation Skills	**Credit Hours**	**3** (3,0)
Course Code	CSC 2101	**Prerequisite(s)**	CSC 1102

Course Description

The course is aimed at improving English language communication and presentation skills of students. With a multidimensional approach, the course enables students to practice the use of English in everyday situations, building upon all four skills: listening, speaking, reading and writing. It prepares them to participate in seminars and discussions and make effective presentations, with an awareness of the audience and effective use of verbal and non-verbal communication. The course addresses the basic English language issues faced by the learners, while also aiming to foster in them, critical skills to develop a concise and clear argument, respond to others' comments and negotiate their own point of view persuasively. The course uses an interactive, participatory methodology, to engage learners' interest and boost their confidence to use English in everyday communication in formal and informal contexts.

Equivalent Course(s) ME 1101, MD 1122, SS 1116, BIO 1111, AF 1203, EN 1106

Course Name	Probability and Statistics	**Credit Hours**	**3** (3,0)
Course Code	CSC 1206	**Prerequisite(s)**	None

Course Description

The course "Statistics and Probability" emphasizes the probabilistic foundations required to understand probability models and statistical methods. Topics covered includes the introduction to statistical methods (understanding data and its importance, data classification, tabulation, and graphical representation), Central Tendencies, dispersion. Probability axioms, basic combinatory, discrete and continuous random variables, probability distributions, mathematical expectation, common families of probability distributions and introduction to correlation and regression. Brief discussion on Statistical Inferences and real life case studies will be included to further enhance students' understanding on the subject matter.

Equivalent Course(s) BA 3605, BA 5405

Course Name	Islamic Studies/Humanities	**Credit Hours**	**2** (2,0)
Course Code	CSC 1209	**Prerequisite(s)**	None

Course Description

This course covers the fundamentals of Islam (Aqaid, Ibadat, Islamic Dawah etc.); ethical values of Islam; seerah of the Holy Prophet (PBUH); Islamic civilization and its effects on humanity, study of other prominent world religions and ethical systems in comparison with Islamic viewpoint;

Equivalent Course(s) ME 1106

Course Name	Computer Organization and Assembly Language	**Credit Hours**	**4** (3,1)
Course Code	CSC 2201	**Prerequisite(s)**	None

Course Description

This course teaches: Microprocessor Bus Structure: Addressing, Data and Control, Memory Organization and Structure (Segmented and Linear Models), Introduction to Registers and Flags, Data Movement, Arithmetic and Logic, Programmer Control, Subroutines, Stack and its operation, Peripheral Control Interrupts, Interfacing with high level languages, Real-time application, Objectives and Perspectives of Assembly Language, Addressing Modes, Introduction to the Assembler and Debugger, Manipulate and translate machine and assembly code, describe actions inside the processing chip, Discuss operations performed by an instruction set, Write a fully documented program, and Using an assembler of choice.

Equivalent Course(s) None

Course Name	Data Structures and Algorithms	**Credit Hours**	**4** (3,1)
Course Code	CSC 2102	**Prerequisite(s)**	CSC 1208

Course Description

This course covers the concept of specification, design, implementation, and use of the basic data types; important programming techniques, data abstraction techniques, object oriented programming and sorting; data types: sets, bags, sequential lists, order lists, stacks, queues, and trees; types of searching such as linear and binary search, and different techniques of sorting; linear data structures and implementation each with C++/Java and non-linear data structures with implementation and the complexity of an algorithm of search and sorting.

Equivalent Course(s) None

Course Name	Discrete Mathematical Structures	**Credit Hours**	**3** (3,0)
Course Code	CSC 1201	**Prerequisite(s)**	None

Course Description

This course introduces the applications of discrete mathematics in the field of computer science. It also covers sets, logic, proving techniques, combinatorics, functions, relations, graph theory and algebraic structures. These basic concepts of sets, logic functions and graph theory are applied to Boolean Algebra and logic networks, while the advanced concepts of functions and algebraic structures are applied to finite state machines and coding theory.

Equivalent Course(s) None

Course Name	Design and Analysis of Algorithms	**Credit Hours**	**3** (3,0)
Course Code	CSC 3202	**Prerequisite(s)**	CSC 2102

Course Description

This course will cover the basic approaches and mindsets for analyzing and designing algorithms and data structures. Topics will range from time space complexity to sorting, searching, and selection algorithms. Algorithm design techniques: divide-and-conquer, dynamic programming, greedy algorithms and others will be covered along with fundamental graph problems: minimum-cost spanning tree, connected components, topological sort, and shortest paths.

Equivalent Course(s) None

Course Name	Finite Automata Theory and Formal Languages	**Credit Hours**	**3** (3,0)
Course Code	CSC 2204	**Prerequisite(s)**	None

Course Description

In this course we are primarily concerned with what computers can do. It turns out that there are problems that cannot be solved by computer, or, at least, by machines corresponding to the mathematical models of computers we shall present. Finite Automata is the theoretical study of capabilities and limitations of Computers. This course introduces finite automata, formal languages and computability, including regular and context-free languages, context-free grammar, Pushdown Automata, and Turing Machine.

Equivalent Course(s) None

Course Name	Database Systems	**Credit Hours**	**4** (3,1)
Course Code	CSC 2203	**Prerequisite(s)**	CSC 2102

Course Description

This course covers: Basic database concepts; Entity Relationship modelling, Relational data model and algebra, Structured Query language; RDBMS; Database design, functional dependencies and normal forms; Transaction processing and optimization concepts; concurrency control and recovery techniques; and Database security and authorization. It also covers Small Group Project implementing a database; Physical database design; Storage and file structure indexed files, b-trees; files with dense index, files with variable length records, database efficiency and tuning.

Equivalent Course(s) None

Course Name	Linear Algebra	**Credit Hours**	**3** (3,0)
Course Code	CSC 2206	**Prerequisite(s)**	None

Course Description

The objective of the course is to provide a rigorous approach towards the solutions of linear models which involves more than one variable. The techniques discussed in this course can be implemented on a wide range of applications from physical world. The matrix algebra will be helpful in performing and understanding of matrix computations on a machine. The eigenvalues, eigenvectors, inner product spaces, orthogonally are useful concepts for the analysis of dynamical systems.

Equivalent Course(s) ME 1202

Course Name	Compiler Construction	**Credit Hours**	**3** (3,0)
Course Code	CSC 3201	**Prerequisite(s)**	CSC 2204

Course Description

This course provides a thorough understanding of the basic structure of compilers for programming languages. A major part of the course consists of the implementation of a compiler for a simplified Pascal-like language. The course will acquaint students with software tools and techniques for developing compilers.

Equivalent Course(s) None

Course Name	Operating Systems	**Credit Hours**	**4** (3,1)
Course Code	CSC 2205	**Prerequisite(s)**	CSC 2102

Course Description

This course involves study of concepts and components of general purpose operating systems. These include the study of processes and process synchronization, multithreaded applications, deadlocks, memory management, and file systems. Further, UNIX and Windows NT are general purpose operating systems used as examples when studying these concepts. Laboratory assignments of process/thread synchronization, process communication, and file systems are given.

Equivalent Course(s) None

Course Name	Software Engineering	**Credit Hours**	**3** (3,0)
Course Code	CSC 3109	**Prerequisite(s)**	None

Course Description

The topics covered in this course includes: Introduction to Software Process Models; Programming in the Large vs. Individual Programming; Evaluation of Software Process Models; Requirements Analysis and Design Modeling Tools; Testing Tools; Programming Environments that Automate Parts of Program Construction Processes; Tool Integration Concepts and Mechanisms; Functional Requirements; Properties of Requirements; Software Requirements Elicitation; Describing System Data; Non-Functional Requirements; Requirements Specifications; System Design Principles; Design Paradigms; Structural and Behavioral Models of Software Designs; Design Patterns; Relationships between Requirements and Designs; Software Architecture; Refactoring Designs using Design Patterns; The Use of Components in Design; Coding Practices; Coding Standards; Integration Strategies; Verification and Validation; Inspections; Reviews; Audits; Testing Types; Testing Fundamentals; Defect Tracking; and Limitations of Testing.

Equivalent Course(s) None

Course Name	Artificial Intelligence	**Credit Hours**	**4** (3,1)
Course Code	CSC 4101	**Prerequisite(s)**	CSC 1201

Course Description

This course covers Artificial Intelligence: Introduction, and Intelligent Agents; Problem-solving: Solving Problems by Searching, Informed Search and Exploration, Constraint Satisfaction Problems, and Adversarial Search; Knowledge and reasoning: Logical Agents, First-Order Logic, Inference in First-Order Logic, Knowledge Representation. Planning and Acting in the Real World; Uncertain knowledge and reasoning: Uncertainty, Probabilistic Reasoning, Probabilistic Reasoning over Time, Making Simple Decisions, and Making Complex Decisions; Learning; Learning from Observations, Knowledge in Learning, Statistical Learning Methods, and Reinforcement Learning; Communicating, Perceiving and Acting: Communication, Probabilistic Language Processing, Perception and Robotics; Introduction to LISP/PROLOG, and Expert Systems (ES) and Applications.

Equivalent Course(s) None

Course Name	Computer Networks and Data Communications	**Credit Hours**	**4** (3,1)
Course Code	CSC 3205	**Prerequisite(s)**	None

Course Description

This course provide students with an overview of the concepts and fundamentals of data communication and computer networks. Topics includes: data communication concepts and techniques in a layered network architecture, communications switching and routing, types of communication, network congestion, network topologies, network configuration and management, network model components, layered network models (OSI reference model, TCP/IP networking architecture) and their protocols, various types of networks (LAN, MAN, WAN and Wireless networks) and their protocols.

Equivalent Course(s) None

Course Name	Technical and Business Writing	**Credit Hours**	**3** (3,0)
Course Code	CSC 1205	**Prerequisite(s)**	None

Course Description

Technical and Business Writing/Business and Electronic Communications aims to teach the principles and methodology of written and oral communication in the workplace. As business communicators you will be required to draft messages using a variety of communication channels and integrated electronic media. This course will prepare students to communicate knowledge and information to different audiences ranging from experts, to coworkers, to customers and to laypersons and to make the best use of electronic media.

Equivalent Course(s) BIO 2411

Course Name	Professional Practices	**Credit Hours**	**3** (3,0)
Course Code	CSC 4102	**Prerequisite(s)**	None

Course Description

This course provides an introduction to and an overview of the professional practices of software engineers. Also it provides necessary knowledge and set of skills/ tools to aid understanding at a strategic level and the day to day tasks of technology professionals. This will be done by encouraging professionalism and professional practice methods cases to understand the huge horizons. In addition, students will identify ethical conflicts, identify their responsibilities and options, and think through the implications of possible solutions to ethical conflicts.

Equivalent Course(s) None

Course Name	Final Year Project-I	**Credit Hours**	**3** (0,3)
Course Code	CSC 4105	**Prerequisite(s)**	None

Course Description

This is the project that final year students carry out as part of their degree requirement. Part-I generally carries to build concept and prototype model. The objective of this course is to implement and demonstrate the software engineering processes and principles which include; project analysis, design, implementation and evaluation of a large-scale problem involving computer and computational systems. The project is supervised by a faculty member, under whose guidance each project team will research the solution. The mid evaluation is performed by a team of experts at the conclusion of part-1.

Equivalent Course(s) None

Course Name	Parallel & Distributed Computing	**Credit Hours**	**3** (3,0)
Course Code	CSC 4106	**Prerequisite(s)**	CSC 2205

Course Description

This course covers Asynchronous/synchronous computation/ communication, concurrency control, fault tolerance, GPU architecture and programming, heterogeneity, interconnection topologies, load balancing, memory consistency model, memory hierarchies, Message Passing Interface (MPI), MIMD/SIMD, multithreaded programming, parallel algorithms & architectures, parallel I/O, performance analysis and tuning, power, programming models (data parallel, task parallel, process-centric, shared/distributed memory), scalability and performance studies, scheduling, storage systems, synchronization, and tools (Cuda, Swift, Globus, Condor, Amazon AWS, OpenStack, Cilk, gdb, threads, MPICH, OpenMP, Hadoop, FUSE).

Equivalent Course(s) None

Course Name	Final Year Project-II	**Credit Hours**	**3** (0,3)
Course Code	CSC 4205	**Prerequisite(s)**	None

Course Description

This is the continuation of FYP-I taken in the previous semester. In this phase, students build the actual project after duly completing the prototype in part-I. The complete project is evaluated by a team of experts at the conclusion of part-II.

Equivalent Course(s) None

Course Name	Information Security	**Credit Hours**	**3** (3,0)
Course Code	CSC 4201	**Prerequisite(s)**	None

Course Description	This course covers information security foundations, security design principles; security mechanisms, symmetric and asymmetric cryptography, encryption, hash functions, digital signatures, key management, authentication and access control; software security, vulnerabilities and protections, malware, database security; network security, firewalls, intrusion detection; security policies, policy formation and enforcement, risk assessment, cybercrime, law and ethics in information security, privacy and anonymity of data
Equivalent Course(s)	None

2.0 Bachelor of Science

2.1.2 Bachelor of Science in Artificial Intelligence (BSAI)

The BS (AI) prepares the students with in-depth knowledge to transform large and complex scenarios into actionable decisions. The curriculum of the BS (AI) program covers the domain such as soft-computing, mathematics, automated reasoning, statistics, computational theory & modeling, knowledge representation & reasoning, machine learning, deep learning, natural language processing, vision, and symbolic computation, etc. The BS (AI) consists of 41 courses (five courses per semester) with total of 130 credit hours. The maximum time to complete the degree is six years.

Course Code	Course Title	Page #
	First Year	
	First Semester	
CSC 1108	Introduction to Computer Science	110
CSCL 1108	Lab: Introduction to Computer Science	110
CSC 1103	Fundamentals of Programming	110
CSCL 1103	Lab: Fundamentals of Programming	111
CSC xxxx	Islamic Studies/ Ethics	111
CSC 1101	Calculus and Analytical Geometry	111
CSC 1102	English Composition and Comprehension	111
	Second Semester	
CSC 1208	Object Oriented Programming Techniques	112
CSCL 1208	Lab: Object Oriented Programming Techniques	112
CSC 2103	Digital Logic Design	113
CSCL 2103	Lab: Digital Logic Design	113
CSC 2206	Linear Algebra	113
CSC xxxx	Probability and Statistics	114
CSC 2101	Communication and Presentation Skills	114
	Second Year	
	Third Semester	
CSC 2102	Data Structures and Algorithms	114
CSCL 2102	Lab: Data Structures and Algorithms	115
CSC 2201	Computer Organization and Assembly Language	115
CSCL 2201	Lab: Computer Organization and Assembly Language	115
CSC 1201	Discrete Mathematical Structures	115
CSC 4101	Artificial Intelligence	116
CSCL 4101	Lab: Artificial Intelligence	116
CSC xxxx	Differential Equations	116
	Fourth Semester	
CSC 3205	Computer Networks and Data Communications	117
CSCL 3205	Lab: Computer Networks and Data Communications	117
CSC 2203	Database Systems	117
CSCL 2203	Lab: Database Systems	118
CSC 3202	Design and Analysis of Algorithms	118
AIC xxx1	Programming for Artificial Intelligence	118
AICL xxx1	Lab: Programming for Artificial Intelligence	119
AC xxxx	AI Elective-1	-

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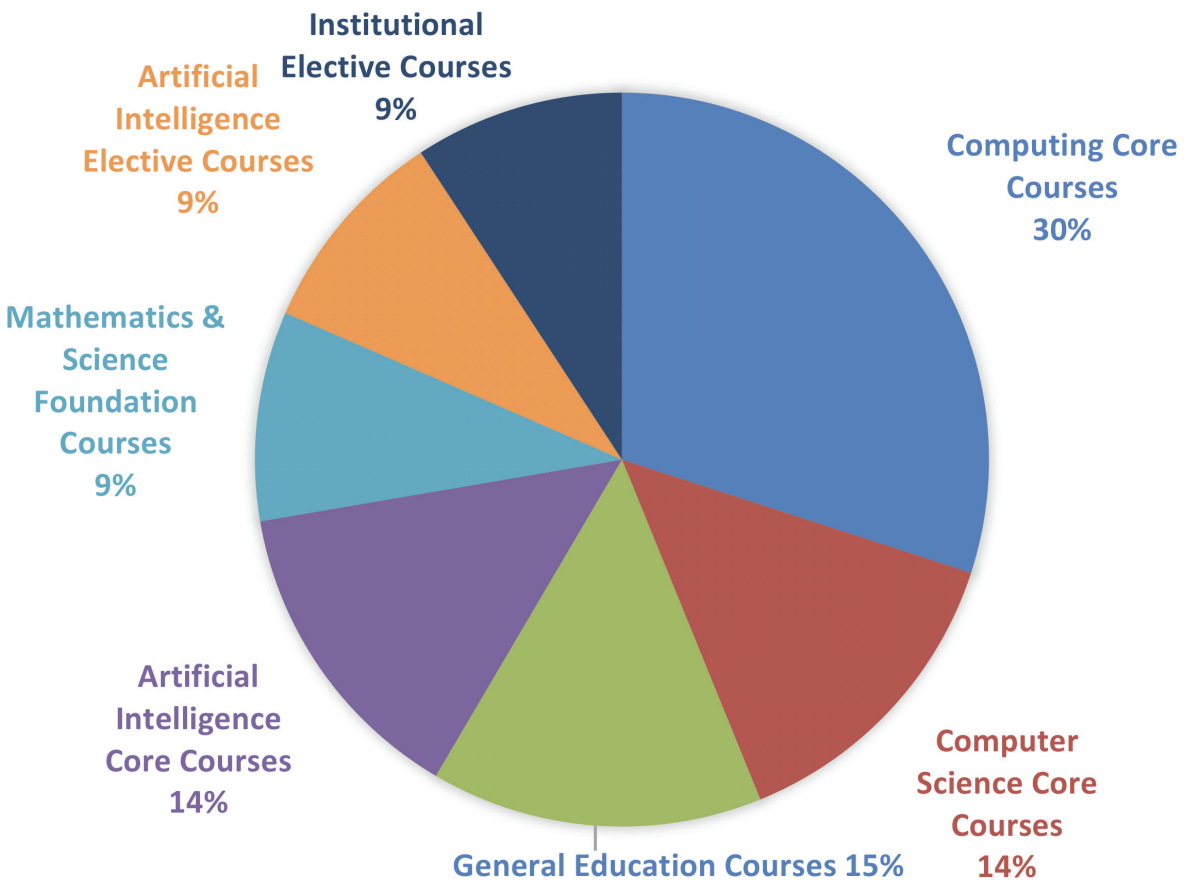
Course Code	Course Title	Page #
	Third Year	
	Fifth Semester	
CSC 2205	Operating Systems	119
CSCL 2205	Lab: Operating Systems	119
AIC xxx2	Artificial Neural Networks	119
AICL xxx2	Lab: Artificial Neural Networks	120
AIC xxx3	Machine Learning	120
AICL xxx3	Lab: Machine Learning	120
AIC xxx4	Knowledge Representation & Reasoning	120
AIC xxx4	AI Elective-2	-
CSC xxxx	University Elective-1	-
	Sixth Semester	
AIC 1205	Technical and Business Writing	121
AIC xxx5/CSC xxx	Computing Vision	121
AICL xxx5	Lab: Computing Vision	121
AIC xxxx/CSC xxx	Natural Language Processing	121
CSC 3109	Software Engineering	122
AIC xxxx	AI Elective-3	-
AIC xxxx	University Elective-2	-
	Fourth Year	
	Seventh Semester	
CSCSC 4106	Parallel and Distributed Computing	122
CSCL 4106	Lab: Parallel and Distributed Computing	122
CSC 4102	Professional Practices	123
AIC xxxx	University Elective-3	-
AIC 4105	Final Year Project-I	-
	Eight Semester	
AIC 4201	Information Security	123
AIC 4205	Final Year Project-II	-
CSC xxxx	Pakistan Studies	123
AIC 4xxx	University Elective-4	-
AIC xxxx	AI Elective-4	-

2.1.2 Bachelor of Science in Artificial Intelligence (BSAI)

The distribution of the courses is as follow:

	Knowledge Area	No. of Courses	No. of Credit Hours
I.	**Core Courses (List Attached)**		
	i. Computing Core Courses	11	39
	ii. Computer Science Core Courses	5	18
	iii. General Education Courses	7	19
	iv. Artificial Intelligence Core Courses	6	18
II.	**Elective Courses (List Attached)**		
	i. Mathematics & Science Foundation Courses	4	12
	ii. Artificial Intelligence Elective Courses	4	12
	iii. Institutional Elective Courses	4	12
	Total	**41**	**130**



21.2 Bachelor of Science in Artificial Intelligence (BSAI)

Compulsory Courses

Course Name	Introduction to Computer Science	**Credit Hours**	**2** (2,0)
Course Code	CSC 1108	**Prerequisite(s)**	None

Course Description

This course covers the basics of Information and Communications Technologies. The main topics covered in this course are as follows - Basic Definitions; Concepts and History of Computers; The Parts of Computer Hardware: Computer Systems & Components, Storage Devices, Machine Level Representation of Data, Number Systems, Machine Cycle, and Microcomputer Processor; Software: Operating Systems, Programming and Application Software; Introduction to Programming; Introduction to Databases and Information Systems; Networks; Data Communication; The Internet: Browsers and Search Engines, Email, Collaborative Computing and Social Networking; E-Commerce; Foundational Concepts in IT Security and other Related Issues.

Equivalent Course(s) None

Course Name	Lab Introduction to Computer Science	**Credit Hours**	**1** (0,1)
Course Code	CSCL 1108	**Prerequisite(s)**	None

Course Description

This course covers the basics of Information and Communications Technologies. The main topics covered in this course are as follows - Basic Definitions; Concepts and History of Computers; The Parts of Computer Hardware: Computer Systems & Components, Storage Devices, Machine Level Representation of Data, Number Systems, Machine Cycle, and Microcomputer Processor; Software: Operating Systems, Programming and Application Software; Introduction to Programming; Introduction to Databases and Information Systems; Networks; Data Communication; The Internet: Browsers and Search Engines, Email, Collaborative Computing and Social Networking; E-Commerce; Foundational Concepts in IT Security and other Related Issues.

Equivalent Course(s) None

Course Name	Fundamentals of Programming	**Credit Hours**	**3** (3,0)
Course Code	CSC 1103	**Prerequisite(s)**	None

Course Description

This course is about learning the basics of programming languages. It provides overview and Principles of Structured and Modular Programming, and subsequently targets the development of coding abilities in a student. Later, it develops skills to identify errors, troubleshoot and finally, to analyze a C++ programming code. To do so, the following technical topics are covered: Constructs, Data Types; Basics of Input and Output, Selection and Decision (If, If- Else, Nested If-Else, Switch Statement and Condition Operator), Repetition (While and For Loop, Do-While Loops), Break Statement, Continue Statement, Control Structures, Functions, Arrays, File Handling.

Equivalent Course(s) None

2.1.2 Bachelor of Science in Artificial Intelligence (BSAI)

Course Name	Lab Fundamentals of Programming	**Credit Hours**	**1** (0,1)
Course Code	CSCL 1103	**Prerequisite(s)**	None

Course Description

This is an introductory level course providing fundamental concepts, intended for students with no prior programming experience. Using both lecture and laboratory practice, students will receive a foundation in programming focusing on C++. Each lecture session is followed by a lab session to provide hands-on experience of lecture concepts. Topics include syntax and semantics of higher-level languages: variables, data types, conditional and iterative control structures, functions, file I/O and mechanism of debugging.

Equivalent Course(s) None

Course Name	Islamic Studies / Ethics	**Credit Hours**	**2** (2,0)
Course Code	CSC xxxx	**Prerequisite(s)**	None

Course Description

The course begins with explanation of Articles of Islamic Faith including some discussion on Quran and modern science. Seerah of Prophet (PBUH) is discussed in length as well as his missions as given in the holy Quran. Selected verses of Holy Quran are discussed followed by basics of science of Hadith and 20 selected Ahadith. Worships like Prayers, Zakat, Fasting and Hajj are covered next. Last lectures are devoted to Islamic civilization, jurisprudence, economic system and the human rights.

Equivalent Course(s) None

Course Name	Calculus and Analytical Geometry	**Credit Hours**	**3** (3,0)
Course Code	CSC 1101	**Prerequisite(s)**	None

Course Description

This course begins with a review of function; then the idea of limit and continuity is introduced. With the knowledge of limits and continuity the student develops the concept of the derivative and its applications. Further, the student studies the anti-derivative of elementary functions and the applications of the definite integral in geometry, science, and engineering. At the end, series convergence is introduced.

Equivalent Course(s) None

Course Name	English Composition & Comprehension	**Credit Hours**	**3** (3,0)
Course Code	CSC 1102	**Prerequisite(s)**	None

Course Description

The core objective of this course is to enable students to become better listeners, readers and writers. This includes the ability to use appropriate words according to the context, construct coherent paragraphs through summarizing, paraphrasing, process analysis, cause and effect, comparison and contrast and making oral presentations effective through an understanding of non-verbal means of communication.

Equivalent Course(s) None

21.2 Bachelor of Science in Artificial Intelligence (BSAI)

Course Name	Object Oriented Programming Technique	**Credit Hours**	**3** (3,0)
Course Code	CSC 1208	**Prerequisite(s)**	CSC 1103

Course Description

This course emphasis the concepts of object oriented techniques used in developing computer based system. The topics are, Evolution of Object Oriented Programming (OOP); Object Oriented Concepts and Principles; Problem Solving in Object Oriented Paradigm; OOP Design: Decomposition into Objects, Class-Hierarchy Design for Modeling; Association; Aggregation; Composition; Definition of Classes; Subclasses; Inheritance; Method Overriding; Dynamic Dispatch: Definition of Method-Call; Sub-typing: Subtype Polymorphism, Implicit Up-casts, Notion of Behavioral Replacement (Subtypes acting like Super-types), Relationship between Sub-typing and Inheritance; Generic Types; Static and Dynamic Typing; Object-Oriented Idioms for Encapsulation: Privacy and Visibility of Class Members, Interfaces, Abstract Base Classes; Using Library Components such as Collection Classes and Iterators; Exception Handling; Events and Event Handlers; Canonical Uses such as GUIs, Mobile Devices; Using Reactive Framework; Externally-Generated Events and Program-Generated Events.

Equivalent Course(s) None

Course Name	Lab Object Oriented Programming Techniques	**Credit Hours**	**1** (1,0)
Course Code	CSCL 1208	**Prerequisite(s)**	None

Course Description

This course emphasis the concepts of object-oriented techniques used in developing computer-based system. The topics are, Evolution of Object Oriented Programming (OOP); Object Oriented Concepts and Principles; Problem Solving in Object Oriented Paradigm; OOP Design: Decomposition into Objects, Class-Hierarchy Design for Modeling; Association; Aggregation; Composition; Definition of Classes; Subclasses; Inheritance; Method Overriding; Polymorphism, Generic Types; Static and Dynamic Typing; Object- Oriented Idioms for Encapsulation: Privacy and Visibility of Class Members, Interfaces, Abstract Base Classes; Using Library Components such as Collection Classes and Iterators; Exception Handling; Events and Event Handlers; Canonical Uses such as GUIs, Mobile Devices; Using Reactive Framework; Externally-Generated Events and Program-Generated Events.

Equivalent Course(s) None

2.1.2 Bachelor of Science in Artificial Intelligence (BSAI)

Course Name	Digital Logic Design	**Credit Hours**	**3** (3,0)
Course Code	CSC 2103	**Prerequisite(s)**	None

Course Description

This course covers the basics of digital logic circuits and design. Through the basic understanding of Boolean algebra and number systems it introduces the student to the fundamentals of combinational logic design and then to sequential circuits (both synchronous and asynchronous). Memory systems are also covered. Finally, the student is introduced to Register Transfer Logic design and the structured implementation of controllers and microprogrammed computers.

Equivalent Course(s) None

Course Name	Lab Digital Logic Design	**Credit Hours**	**1** (0,1)
Course Code	CSCL 2103	**Prerequisite(s)**	None

Course Description

This course covers the basics of digital logic circuits and design. Through the basic understanding of Boolean algebra and number systems it introduces the student to the fundamentals of combinational logic design and then to sequential circuits (both synchronous and asynchronous). Memory systems are also covered. Finally, the student is introduced to Register Transfer Logic design and the structured implementation of controllers and micro- programmed computers.

Equivalent Course(s) None

Course Name	Linear Algebra	**Credit Hours**	**3** (3,0)
Course Code	CSC 2206	**Prerequisite(s)**	CSC 1101

Course Description

The objective of the course is to provide a rigorous approach towards the solutions of linear models which involves more than one variable. The techniques discussed in this course can be implemented on a wide range of applications from physical world. The matrix algebra will be helpful in performing and understanding of matrix computations on a machine. The eigenvalues, eigenvectors, inner product spaces, orthogonality are useful concepts for the analysis of dynamical systems.

Equivalent Course(s) None

21.2 Bachelor of Science in Artificial Intelligence (BSAI)

Course Name	Probability and Statistics	**Credit Hours**	**3** (3,0)
Course Code	CSC xxxx	**Prerequisite(s)**	None

Course Description

A course "Statistics and Probability Theory" emphasizes the probabilistic foundations required to understand probability models and statistical methods. Topics covered will include the introduction to statistical methods (understanding data and its importance, data classification, tabulation, graphical representation), Central Tendencies, dispersion. Probability axioms, basic combinatory, discrete and continuous random variables, probability distributions, mathematical expectation, common families of probability distributions. Introduction to correlation and regression.

Equivalent Course(s) None

Course Name	Communication & Presentation Skills	**Credit Hours**	**3** (3,0)
Course Code	CSC 2101	**Prerequisite(s)**	CSC 1102

Course Description

The course is aimed at improving English language communication and presentation skills of students. With a multidimensional approach, the course enables the students to practice the use of English in everyday situations, building upon all four skills: listening, speaking, reading and writing. It prepares them to participate in seminars and discussions and make effective presentations, with an awareness of the audience and effective use of verbal and non- verbal communication. The course addresses the basic English language issues faced by the learners, while also aiming to foster in them, critical skills to develop a concise and clear argument, respond to others' comments and negotiate their own point of view persuasively. The course uses an interactive, participatory methodology, to engage learners' interest and boost their confidence to use English in everyday communication in formal and informal contexts.

Equivalent Course(s) None

Course Name	Data Structures and Algorithms	**Credit Hours**	**3** (3,0)
Course Code	CSC 2102	**Prerequisite(s)**	CSC 1103

Course Description

The purpose of this course is to provide the students with solid foundations in the basic concepts of programming: data structures and algorithms. The main objective of the course is to teach the students how to select and design data structures and algorithms that are appropriate for problems that they might encounter. This course is also about showing the correctness of algorithms and studying their computational complexities.

Equivalent Course(s) None

2.1.2 Bachelor of Science in Artificial Intelligence (BSAI)

Course Name	Lab Data Structures and Algorithms	**Credit Hours**	**1** (0,1)
Course Code	CSCL 2102	**Prerequisite(s)**	None
Course Description	The main topics covered in this course are as follows Introduction, Arrays, Linked Lists, Stacks, Queues, analysis of algorithms, trees, binary search trees, hash tables, graphs, graph traversals, graph algorithms, Sorting.		
Equivalent Course(s)	None		

Course Name	Computer Organization and Assembly Language	**Credit Hours**	**3** (3,0)
Course Code	CSC 2201	**Prerequisite(s)**	CSC 2103
Course Description	This course covers the fundamental concepts of Computer organization and Assembly language. The tops include: Octal and hexadecimal number systems, ASCII codes, Assembly language programming. Instruction formats and types, memory and I/O instructions, arithmetic instructions, addressing modes, stack operations, procedures, conditional processing, shift and rotate instructions along with Multiplication and division. Advance procedures and interrupt handling. Practice of assembly language programming.		
Equivalent Course(s)	None		

Course Name	Lab Computer Organization and Assembly Language	**Credit Hours**	**1** (0,1)
Course Code	CSC 2201	**Prerequisite(s)**	None
Course Description	This course covers the fundamental concepts of Computer organization and Assembly language. The tops include: Octal and hexadecimal number systems, ASCII codes, Assembly language programming. Instruction formats and types, memory and I/O instructions, arithmetic instructions, addressing modes, stack operations, procedures, conditional processing, shift and rotate instructions along with Multiplication and division. Advance procedures and interrupt handling. Practice of assembly language programming.		
Equivalent Course(s)	None		

Course Name	Discrete Mathematical Structures	**Credit Hours**	**3** (3,0)
Course Code	CSC 1201	**Prerequisite(s)**	None
Course Description	Introduces the foundations of discrete mathematics as they apply to Computer Science, focusing on providing a solid theoretical foundation for further work. Further, this course aims to develop understanding and appreciation of the finite nature inherent in most Computer Science problems and structures through study of combinatorial reasoning, abstract algebra, iterative procedures, predicate calculus, tree and graph structures.		
Equivalent Course(s)	None		

2.1.2 Bachelor of Science in Artificial Intelligence (BSAI)

Course Name	Artificial Intelligence	**Credit Hours**	**3** (3,0)
Course Code	CSC 4101	**Prerequisite(s)**	CSC 1208

Course Description

This course gives a broad overview of the fundamental theories and techniques of Artificial Intelligence. Major topics covered in the lectures include: Overview of AI Problems; Intelligent Behavior: Turing Test, Rationale versus Non-rationale Reasoning; Problem Characteristics: Fully versus Partially Observable, Single versus Multi agent; Intelligent Agents: reactive, deliberative, goal-driven, utility-driven, and learning agents; Uninformed Search: Depth First, Breadth First, Depth First with Iterative Deepening; Informed Search: Hill climbing, A*- Search and their Time and Space Complexity, Local Search, Genetic Algorithm; Game Playing: Min-max, Evaluation functions, Alpha-beta pruning; Propositional and Predicate Logic; Resolution and Theorem Proving; Forward and Backward Chaining; Machine Learning: Introduction, Supervised learning: Inductive learning, Decision tree, Artificial neural networks.

Equivalent Course(s) None

Course Name	Lab Artificial Intelligence	**Credit Hours**	**1** (0,1)
Course Code	CSCL 4101	**Prerequisite(s)**	None

Course Description

This course gives a broad overview of the fundamental theories and techniques of Artificial Intelligence. Major topics covered in the lectures include: Overview of AI Problems; Intelligent Behavior: Turing Test, Rationale versus Non-rationale Reasoning; Problem Characteristics: Fully versus Partially Observable, Single versus Multi agent; Intelligent Agents: reactive, deliberative, goal-driven, utility-driven, and learning agents; Uninformed Search: Depth First, Breadth First, Depth First with Iterative Deepening; Informed Search: Hill climbing, A*- Search and their Time and Space Complexity, Local Search, Genetic Algorithm; Game Playing: Min-max, Evaluation functions, Alpha-beta pruning; Propositional and Predicate Logic; Resolution and Theorem Proving; Forward and Backward Chaining; Machine Learning: Introduction, Supervised learning: Inductive learning, Decision tree, Artificial neural networks.

Equivalent Course(s) None

Course Name	Differential Equations	**Credit Hours**	**3** (3,0)
Course Code	CSC xxxx	**Prerequisite(s)**	CSC 1101

Course Description

This course provides an introduction to topics involving ordinary differential equations. Emphasis is placed on the development of abstract concepts and applications for first-order and second-order differential equations. Upon completion, students will be able to demonstrate understanding of the theoretical concepts and select and use appropriate models and techniques for finding solutions to differential equations-related problems with and without technology.

Equivalent Course(s) None

2.1.2 Bachelor of Science in Artificial Intelligence (BSAI)

Course Name	Computer Networks and Data Communications	**Credit Hours**	**3** (3,0)
Course Code	CSC 3205	**Prerequisite(s)**	None

Course Description	This course provides the students with an overview of the concepts and fundamentals of data communication and computer networks. Topics to be covered include : data communication concepts and techniques in a layered network architecture, communications switching and routing, types of communication, network congestion, network topologies, network configuration and management, network model components, layered network models(OSI reference model, TCP/IP networking architecture) and their protocols, various types of networks (LAN,MAN,WAN and Wireless networks) and their protocols.
Equivalent Course(s)	None

Course Name	Lab Computer Networks Data and Communications	**Credit Hours**	**1** (0,1)
Course Code	CSCL 3205	**Prerequisite(s)**	None

Course Description	Goal of this course is to give some insight into the rationale of why networks are structured the way they are today and to understand the issues facing the designers of next-generation data networks. Much of the course focuses on network algorithms and their performance. Students are expected to have a strong mathematical background and an understanding of probability theory. Topics discussed include: layered network architecture, Link Layer protocols, high-speed packet switching, queuing theory, Local Area Networks, and Wide Area Networking issues, including routing and flow control protocols.
Equivalent Course(s)	None

Course Name	Database Systems	**Credit Hours**	**3** (3,0)
Course Code	CSC 2203	**Prerequisite(s)**	None

Course Description	Introduce the concept of DBMS and its purpose. Introduce the main concepts in a Database (Tables, records, fields, primary key, foreign key, relation etc). Learn how to design a logical database model, convert the logical database designs to physical designs (Mapping), and develop the physical database. Introduce the concept of normalization theory (1NF, 2NF, and 3NF). Enable students to build a desktop application with a database. Enhance students' skills including: team working, problem-solving, and self-learning.
Equivalent Course(s)	None

2.1.2 Bachelor of Science in Artificial Intelligence (BSAI)

Course Name	Lab Database Systems	**Credit Hours**	**1** (0,1)
Course Code	CSCL 2203	**Prerequisite(s)**	None

Course Description

The main objective of this course is to understand user requirements/views analyze existing and future data processing needs, develop an enterprise data model that reflects the organization & fundamental business rules. As a lab course student are introduced with entities, relationships, attributes, and business rules, integration and database views, normalization techniques, data integrity and security requirements. After Conceptual design we implement database using SQL queries and apply different operations constraints on Database.

Equivalent Course(s) None

Course Name	Design and Analysis of Algorithms	**Credit Hours**	**3** (3,0)
Course Code	CSC 3202	**Prerequisite(s)**	CSC 2102

Course Description

This course applies design and analysis techniques to numeric and nonnumeric algorithms which act on data structures. Design is emphasized so that the student will be able to develop new algorithms. Analysis of algorithms is concerned with the resources an algorithm must use to reach a solution. Topics include introduction to algorithm, asymptotic complexity, sorting and searching, divide and conquer, greedy graph algorithms, dynamic programming, data compression, backtracking, branch and bound.

Equivalent Course(s) None

Course Name	Programming for Artificial Intelligence	**Credit Hours**	**2** (2,0)
Course Code	AIC xxx1	**Prerequisite(s)**	AIC 4101

Course Description

The objectives of this course are to provide comprehensive and in-depth knowledge of AI principles and techniques by introducing AI's fundamental problems, and the state-of-the-art models and algorithms used to undertake these problems. This course is also designed to expose students to the frontiers of AI-intensive computing and information systems, while providing a sufficiently strong foundation to encourage further research.

Equivalent Course(s) None

21.2 Bachelor of Science in Artificial Intelligence (BSAI)

Course Name	LAB Programming for Artificial Intelligence	**Credit Hours**	**1** (0,1)
Course Code	AICL xxx1	**Prerequisite(s)**	None

Course Description

The objectives of this course are to provide comprehensive and in-depth knowledge of AI principles and techniques by introducing AI's fundamental problems, and the state-of-the-art models and algorithms used to undertake these problems. This course is also designed to expose students to the frontiers of AI-intensive computing and information systems, while providing a sufficiently strong foundation to encourage further research.

Equivalent Course(s) None

Course Name	Operating Systems	**Credit Hours**	**3** (3,0)
Course Code	CSC 2205	**Prerequisite(s)**	None

Course Description

The purpose of this course is to provide an understanding of operating systems to students so they will be able to understand the terminology surrounding and describing operating systems. Students will become familiar with the kinds of abstractions provided by general purpose operating systems that facilitate the development of user applications. Also they will become familiar with the typical internal policies and mechanisms implemented by operating systems and how they impact system performance.

Equivalent Course(s) None

Course Name	Lab Operating Systems	**Credit Hours**	**1** (0,1)
Course Code	CSCL 2205	**Prerequisite(s)**	None

Course Description

The purpose of this course is to conduct parallel lab sessions against the Theoretical Operating System classes. Whatever topics students are being taught in the Theory classes, some/most of those are supposed to be covered in these equivalent lab sessions in order to simulate those concepts programmatically and subsequently to provide a better understanding of the Theoretical course.

Equivalent Course(s) None

Course Name	Artificial Neural Networks	**Credit Hours**	**2** (2,0)
Course Code	AIC xxx2	**Prerequisite(s)**	AIC xxx1

Course Description

Artificial Neural Network includes subject of the McCulloch-Pitts Model, activation functions, loss and cost functions, feed-forward and feed-back network structures, Single Layer perceptron's, Multi-Layer perceptron's, Radial-based function networks, weighted networks, perceptron learning algorithms, strategies for avoiding overfitting and underfitting, accelerating convergence and recurrent networks.

Equivalent Course(s) None

Course Name	Lab Artificial Neural Networks	**Credit Hours**	**1** (0,1)
Course Code	AIC xxx2	**Prerequisite(s)**	None

Course Description

Artificial Neural Network includes subject of the McCulloch-Pitts Model, activation functions, loss and cost functions, feed-forward and feed-back network structures, Single Layer perceptron's, Multi-Layer perceptron's, Radial-based function networks, weighted networks, perceptron learning algorithms, strategies for avoiding overfitting and underfitting, accelerating convergence and recurrent networks.

Equivalent Course(s) None

Course Name	Machine Learning	**Credit Hours**	**2** (2,0)
Course Code	AIC xxx3	**Prerequisite(s)**	AIC xxx1

Course Description

Machine learning uses interdisciplinary techniques such as statistics, linear algebra, optimization, and computer science to create automated systems that can sift through large volumes of data at high speed to make predictions or decisions without human intervention. Machine learning as a field is now incredibly pervasive, with applications spanning from business intelligence to homeland security, from analyzing biochemical interactions to structural monitoring of aging bridges, and from emissions to astrophysics, etc. This class will familiarize students with a broad cross-section of models and algorithms for machine learning, and prepare students for research or industry application of machine learning techniques.

Equivalent Course(s) None

Course Name	Lab Machine Learning	**Credit Hours**	**1** (0,1)
Course Code	AICL xxx3	**Prerequisite(s)**	None

Course Description

Machine Learning is concerned with computer programs that automatically improve their performance through experience. This lab course covers the practical algorithms for machine learning from a variety of perspectives such as FIND-S, Candidate Elimination Algorithm, Decision tree (ID3 Algorithm), Backpropagation Algorithm, Naïve Bayesian classifier, Bayesian Network, k-Means Algorithm, k-Nearest Neighbour Algorithm, Locally Weighted Regression Algorithm.

Equivalent Course(s) None

Course Name	Knowledge Representation and Reasoning	**Credit Hours**	**3** (3,0)
Course Code	AIC xxx4	**Prerequisite(s)**	AIC xxx1

Course Description

This course is focused on current trends and issues in Knowledge Representation and Reasoning. The intent of this course is to connect students to the topics through lecturers who know their subjects intimately, through continuing active use and research. To this end, there are three lecturers, each with great expertise in the topics they present. The course is structured to keep related topics close together, and to develop some themes. Assessment is based around assignments, which supports "learning by doing" and a final written exam that will examine the material taught across the course.

Equivalent Course(s) None

21.2 Bachelor of Science in Artificial Intelligence (BSAI)

Course Name	Technical and Business Writing	**Credit Hours**	**3** (3,0)
Course Code	CSC 1205	**Prerequisite(s)**	CSC 2101

Course Description

The course aims at developing technical and business writing skills of BS Computer science students. Technical Writing prepares students to design effective technical documents for both written and digital media, with particular emphasis upon technical memos, problem-solving and decision-making reports, and organizational, product-support, and technical-information webs.

Equivalent Course(s) None

Course Name	Computing Vision	**Credit Hours**	**2** (2,0)
Course Code	CSC 5262	**Prerequisite(s)**	AIC xxx2

Course Description

This course provides an introduction to computer vision including fundamentals of image formation, camera imaging geometry, feature detection and matching, stereo, motion estimation and tracking, image classification and scene understanding. We'll develop basic methods for applications that include finding known models in images, depth recovery from stereo, camera calibration, image stabilization, automated alignment, tracking, boundary detection, and recognition.

Equivalent Course(s) None

Course Name	Lab: Computing Vision	**Credit Hours**	**1** (0,1)
Course Code	CSC 5262	**Prerequisite(s)**	None

Course Description

This course provides an introduction to computer vision including fundamentals of image formation, camera imaging geometry, feature detection and matching, stereo, motion estimation and tracking, image classification and scene understanding. We'll develop basic methods for applications that include finding known models in images, depth recovery from stereo, camera calibration, image stabilization, automated alignment, tracking, boundary detection, and recognition.

Equivalent Course(s) None

Course Name	Natural Language Processing	**Credit Hours**	**3** (3,0)
Course Code	AIC xxxx	**Prerequisite(s)**	AIC xxx2

Course Description

Natural Language Processing (NLP) is a rapidly developing field with broad applicability throughout the hard sciences, social sciences, and the humanities. The ability to harness, employ and analyze linguistic and textual data effectively is a highly desirable skill for academic work, in government, and throughout the private sector. This course is intended as a theoretical and methodological introduction to a the most widely used and effective current techniques, strategies and toolkits for natural language processing, with a primary focus on those available in the Python programming language.

Equivalent Course(s) None

21.2 Bachelor of Science in Artificial Intelligence (BSAI)

Course Name	Software Engineering	**Credit Hours**	**3** (3,0)
Course Code	CSC 3109	**Prerequisite(s)**	None

Course Description

Nature of Software, Overview of Software Engineering, Professional software development, Software engineering practice, Software process structure, Software process models, Agile software Development, Agile process models, Agile development techniques, Requirements engineering process, Functional and non-functional requirements, Context models, Interaction models, Structural models, behavioral models, model driven engineering, Architectural design, Design and implementation, UML diagrams, Design patterns, Software testing and quality assurance, Software evolution, Project management and project planning, configuration management, Software Process improvement.

Equivalent Course(s) None

Course Name	Parallel and Distributed Computing	**Credit Hours**	**2** (2,0)
Course Code	CSC 4106	**Prerequisite(s)**	CSC 1208

Course Description

Asynchronous/synchronous computation/communication, concurrency control, fault tolerance, GPU architecture and programming, heterogeneity, interconnection topologies, load balancing, memory consistency model, memory hierarchies, Message passing interface (MPI), MIMD/SIMD, multithreaded programming, parallel algorithms & architectures, parallel I/O, performance analysis and tuning, power, programming models (data parallel, task parallel, process-centric, shared/distributed memory), scalability and performance studies, scheduling, storage systems, synchronization, and tools (Cuda, Swift, Globus, Condor, Amazon AWS, OpenStack, Cilk, gdb, threads, MPICH, OpenMP, Hadoop, FUSE).

Equivalent Course(s) None

Course Name	Lab: Parallel and Distributed Computing	**Credit Hours**	**1** (0,1)
Course Code	CSCL 4106	**Prerequisite(s)**	None

Course Description

This course provides the students with an overview of the concepts and fundamentals of parallel and distributed data processing/ computing focusing the need of next generation computing requirements. Major portion of the course contains hands-on with open MP and MPI operations and real time applications. The final part of the course gives an introduction on entirely distributed environment focusing HADOOP (HDFS and MAPREDUCE) and SPARK (BASICS OF SPARK LIBRARIES i.e., Spark streaming, Spark ML and Spark SQL).

Equivalent Course(s) None

2.1.2 Bachelor of Science in Artificial Intelligence (BSAI)

Course Name	Professional Practices	**Credit Hours**	**3** (3,0)
Course Code	CSC 4102	**Prerequisite(s)**	None

Course Description

Social Context: Social Implications of Computing and Networked Communication, Impact of Social Media on Individualism and Collectivism; Analytical Tools: Ethical Argumentation, Theories and Decision Making, Moral Values; Professional Ethics: Community Values, Nature of Professionalism, Self-assessment, Professional Certification (Such as ACM/IEEE-CS, SE, AITP), Accountability, Responsibility and Liability, Role of Computing Professional in Public Policy; Intellectual Property: Philosophical Foundations of Intellectual Property, Intellectual Property Rights, Intangible Digital Intellectual Rights, Digital Rights Management, Discrimination and Harassment, Forms of Professional Credentialing, Copyrights, Patents, Trade Secrets, Trademarks, Plagiarism, Open Source Movement; Privacy and Civil Liberties/Human Rights: Philosophical Foundations, Legal Foundations of Privacy Protection, Privacy Implications of Widespread Data Collection, Surveillance Systems and Cloud Computing, Technology based Solutions for Privacy Protection, Privacy Legislation in Areas of Practice, Civil Liberties/Human Rights, Cultural & Religious Differences, Freedom of Expression and its Limitations; Sustainability: How to be a Sustainable Practitioner, The global, Social and Environmental Impacts of Computer Use and Disposal; IEEE CS/ACM Code of Ethics and Professional Practice.

Equivalent Course(s) None

Course Name	Information Security	**Credit Hours**	**3** (3,0)
Course Code	CSC 4201	**Prerequisite(s)**	None

Course Description

At the end of the course, the students have firm understanding on basic terminology and concepts related to network and system level security, basics of computers and networking including Internet Protocol, routing, Domain Name Service, and network devices. They are also exposed to basic cryptography, security management, and network security techniques. They also look at policies as a tool to effectively change an organization's culture towards a better secure environment. In the end, the students put it all together in the form of a case study for designing and auditing a security system at conceptual level.

Equivalent Course(s) None

Course Name	Pakistan Studies	**Credit Hours**	**2** (2,0)
Course Code	CSC xxxx	**Prerequisite(s)**	None

Course Description

This course provides an introduction to the history of Pakistan with reference to pre- and post- independence eras, and the contribution of different governments in nationï¿½s social, economic and legislative development over years. The second part of the course focuses on Islam and the present-day Muslim world.

Equivalent Course(s) None

2.2 Master of Science and PhD

2.1.1 Master of Science in Data Sciences (MSDS)

The MS (Data Science) program is of 2-years duration offered in the evening. It requires 30 credit hours including 3 core courses, 2 specialized data science courses and a Thesis of 6 credit hours is mandatory. The maximum time limit to complete the MS (Data Science) degree is 4 years.

The following is the break-up of the minimum credit hours requirements to be fulfilled by the students enrolled in this program:

- *3 Core courses (9 Credit Hours)*
- *2 Specialization Requirement Courses (6 Credit Hours)*
- *3 Electives[16] (9 Credit Hours)*
- *1 Thesis (Part-I & Part-II) (6 Credit Hours)*

Course Code	Course Title	
MSDS	**First Year**	**Page #**
	First Semester	
DSC xxxx	Statistical and Mathematical Methods for Data Science	125
DSC xxxx	Tools and Techniques in Data Science	125
DSCL xxxx	Lab: Tools and Techniques in Data Science	-
DSC xxxx	Elective-I	-
	Second Semester	
DSC xxxx	Machine Learning	126
DSC xxxx	Specialization-Elective-I	-
DSC xxxx	Specialization-Elective-II	-
	Second Year	
	Third Semester	
DSC xxxx	Thesis (Part-I)	-
DSC xxxx	Elective-II	-
	Fourth Semester	
DSC xxxx	Elective-III	-
DSC xxxx	Thesis (Part-II)	-

All courses may not be offered every year. Alternate courses may be substituted as and when required.

16- List of Electives is given in Appendix B

Compulsory Course

Course Name	Statistical and Mathematical Methods for Data Science	**Credit Hours**	**3** (0,0)
Course Code	DSC xxxx	**Prerequisite(s)**	None

Course Description

Probability: Probability basics (axioms of probability, conditional probability, random variables, expectation, independence, etc.), multivariate distributions, Maximum a posteriori and maximum likelihood estimation; **Statistics:** introduction to concentration bounds, laws of large numbers, central limit theorem, minimum mean-squared error estimation, confidence intervals; **Linear algebra:** Vector spaces, Projections (will also cover the least regression), linear transformations, singular value decomposition (this substitute for PCA), eigen decomposition, power method; **Optimization:** Matrix calculus with Lagrange Multipliers, gradient descent, coordinate descent, introduction to convex optimization.

Equivalent Course(s) None

Course Name	Tools and Techniques in Data science	**Credit Hours**	**3** (0,0)
Course Code	DSC xxxx	**Prerequisite(s)**	None

Course Description

Introduction to Data Science, Data Science Life cycle & Process (Asking Right Questions, Obtaining Data, Understanding Data, Building Predictive Models, Generating Visualizations) For Building Data Products, Introduction to Data (Types of Data and Datasets), Data Quality (Measurement and Data Collection Issues), Data pre-processing Stages (Aggregation, Sampling, Dimensionality Reduction, Feature subset selection, Feature creation etc.), Algebraic & Probabilistic View of Data, Introduction to Python Data Science Stack (Python, Numpy, Pandas, Matplotlib), Relational Algebra & SQL, Scraping & Data Wrangling (assessing, structuring, cleaning & munging of data), Basic Descriptive & Exploratory Data Analysis, Introduction to Text Analysis (Stemming, Lemmatization, Bag of Words, TF-IDF), Introduction to Prediction and Inference (Supervised & Unsupervised) Algorithms, Introduction to Scikit Learn, Bias-Variance Tradeoff, Model Evaluation & Performance Metrics (Accuracy, Contingency Matrix, Precision-Recall, F-1 Score, Lift, etc.), Introduction to Map-Reduce paradigm.

Equivalent Course(s) None

21.1 Master of Science in Data Sciences (MSDS)

Course Name	Machine Learning	**Credit Hours**	**3** (0,0)
Course Code	DSC xxxx	**Prerequisite(s)**	None

Course Description

Introduction to machine learning and statistical pattern recognition. Supervised learning: Part I (Graphical models (full Bayes, Naïve Bayes), Decision trees for classification & regression for both categorical & numerical data, Ensemble methods, Random forests, Boosting (Adaboost and Xgboost), Stacking; Part II (Four Components of Machine Learning Algorithm (Hypothesis, Loss Functions, Derivatives and Optimization Algorithms), Gradient Descent, Stochastic Gradient Descent, Linear Regression, Nonlinear Regression, Perceptron, Support vector machines, Kernel Methods, Logistic Regression, Softmax, Neural networks); Unsupervised learning: K-means, Density Based Clustering Methods (DBSCAN, etc.), Gaussian mixture models, EM algorithm, etc.; Reinforcement learning; Tuning model complexity; Bias-Variance Tradeoff; Grid Search, Random Search; Evaluation Metrics; Reporting predictive performance.

Equivalent Course(s) None

2.2 Master of Science and PhD

2.1.1 Master of Science in Computer Science (MSCS)

SZABIST offers Master of Science in Computer Sciences (MSCS) degree in three domains: Core Computer Science and two specialization tracks, i.e., Software Engineering (SE) and Networks and Security (N&S). Students have to complete 4 focused courses in any specific domain. The program is of 2-year duration and is offered in the evening. It requires 33 credit hours to complete the degree with 9 courses (27 credit hours) and Thesis/Research Work (6 credit hours) in not more than four (4) years.

The following is the break-up of the minimum credit hours requirements to be fulfilled by the students enrolled in this program:

- *5 Compulsory/Core Courses (15 Credit Hours)*
- *4 Electives[17] (12 Credit Hours)*
- *1 Thesis (6 Credit Hours) or 2 Course (3 Credit Hours each) or 2 Independent Research Study (3 Credit Hours each)*

Course Code	Course Title	Page #
	First Year	
	First Semester	
CSC 5105	Research Methodology	128
CSC 5101	Advanced Algorithms Analysis	128
CSC 5102	Theory of Computation	129
	Second Semester	
CSC 5201	Advanced Operating Systems	129
CSC 5202	Advanced Computer Architecture	129
CSC 5xxx	Elective-I (CS/SE/N&S Stream)	-
	Second Year	
	Third Semester	
CSC 5xxx	Thesis Or Independent Research Study-I Or Course work (from CS/SE/N&S Stream)	-
CSC 5xxx	Elective-II (from CS/SE/N&S-Stream)	-
CSC 5xxx	Elective-III (from CS/SE/N&S-Stream)	-
	Fourth Semester	
CSC 5xxx	Thesis Or Independent Research Study-II Or Course Work (from CS/SE/N&S-Stream)	-
CSC 5xxx	Elective-IV (from CS/SE/N&S-Stream)	-

All courses may not be offered every year. Alternate courses may be substituted as and when required.

17- List of Electives is given in Appendix B

Compulsory Course

Course Name	Research Methodology	**Credit Hours**	**3** (3,0)
Course Code	CSC 5105	**Prerequisite(s)**	None

Course Description

This course covers international ethical, professional and legal issues in computing research including concept of research, definitions, quantitative and qualitative approaches, proposal for research, forming hypotheses, originality, critical analysis methods; also reading for research; data collection, information gathering; literature surveys and questionnaires data analysis, presentation of information, writing academic papers, content and referencing. The students have to perform meta analyses of 25-30 research papers selected in current research topics in International Journals. Topic and papers are selected with approval from the instructor. Conference papers are not allowed for review. Students have to read all such papers and prepare the analysis related to model, methods, findings and come up with what has been done related to selected area of research and research gaps if any are explicitly identified with future work.

Equivalent Course(s) None

Course Name	Advanced Algorithms Analysis	**Credit Hours**	**3** (3,0)
Course Code	CSC 5101	**Prerequisite(s)**	None

Course Description

Advanced Algorithm Analysis includes the introduction of formal techniques and the underlying mathematical theories like NP-completeness, search techniques, randomized algorithms and heuristic and approximation algorithms. Topics include: asymptotic analysis of upper and average complexity bounds using big-O, little-o, and theta notation. Fundamental algorithmic strategies (brute-force, greedy, divide-and-conquer, backtracking, branch-and-bound, pattern matching, and numerical approximations) are covered. It also covers standard graph and tree algorithms, standard complexity classes, time-space tradeoffs in algorithms, using recurrence relations to analyze recursive algorithms, non-computable functions, the halting problem, and the implications of non-computability. Algorithmic animation is used to reinforce theoretical results. Upon completion of the course, students should be able to explain the mathematical concepts used in describing the complexity of an algorithm, and select and apply algorithms appropriate to a particular situation.

Equivalent Course(s) None

2.2.1 Master of Science in Computer Sciences (MSCS)

Course Name	Theory of Computation	**Credit Hours**	**3** (3,0)
Course Code	CSC 5102	**Prerequisite(s)**	None

Course Description

This course includes set theory, sequences, tuples, functions, relations and graphs; Turing machine; language, designing variants of Turing machines, enumerators, dovetailing, Church-Turing Thesis, Hilbert's Tenth problem, decidable languages, acceptance problem for DFAs, the halting problem, reducibility, recursion theorem, logical theories, complexity theory; time complexity, non-deterministic time, Class P, Class NP, NP-completeness, space complexity, relationship between Space and Time complexity, P-SPACE-completeness, Class L, Class NL and NL-completeness.

Equivalent Course(s) None

Course Name	Advanced Operating Systems	**Credit Hours**	**3** (3,0)
Course Code	CSC 5201	**Prerequisite(s)**	None

Course Description

This course covers characterization of modern operating systems; file systems, memory management techniques, process scheduling and resource management; system models; architectural models; inter process communication; issues of security in distributed systems (partial coverage); distributed file system; concurrency control in distributed systems; problems of coordination and agreement in distributed systems; replication – advantages and requirements; fault-tolerant services and mobile and ubiquitous computing.

Equivalent Course(s) None

Course Name	Advanced Computer Architecture	**Credit Hours**	**3** (3,0)
Course Code	CSC 5202	**Prerequisite(s)**	None

Course Description

This course covers architectural and organizational attributes of computer architecture like Flynn's classifications; SISD, SIMD, MISD and MIMD systems and their working principles, shared versus distributed memory architectures, Bernstein conditions, performance measurements of computers, open architecture versus close architectures, CISC, RISC, conventional versus super-scalar (K-Issue) processors and WINTEL architecture are studied. Furthermore, cache memory, techniques to reduce cache misses, multi-level caches, cache-look-ahead processor, micro-programmed controller versus hardwired controller, CPU performance metrics, pipelining, multiprogramming and time-sharing operating systems, design of a generic processor and its architecture, designing of executable versus hardwired instructions, microcode versus macro code, concept of control word (microinstructions), parallel computing, taxonomy of parallel architectures, parallel applications, synchronization mechanisms, data level parallelism (Vector Processing, Multimedia Applications, Graphics Processing Units) are also covered in the course.

Equivalent Course(s) None

2.2 Master of Science and PhD

2.1.1 Doctor of Philosophy in Computing (PhD Computing)

Doctor of Philosophy in Computing (PhD Computing) program requires completion of a total of 48 credit hours with 5 courses, an Independent Research Study (IRS) and a dissertation. The following is the break-up of the credit hours requirements to be fulfilled by the students enrolled in this program in not more than eight (8) years.

- *5 Elective Courses[18] (15 Credit Hours)*
- *1 Independent Research Study (03 Credit Hours)*
- *1 Dissertation (30 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
CSC 6101	Research Methodology*	131
CSC 6xxx	Elective-I	-
CSC 6xxx	Elective-II	-
	Spring Semester	
CSC 6xxx	Independent Research Study	-
CSC 6xxx	Elective-III	-
CSC 6xxx	Elective-IV	-
	Second Year	
	Fall Semester	
CSC 6xxx	Dissertation	-
	Spring Semester	
CSC 6xxx	Dissertation	-
	Third Year	
	Fall Semester	
CSC 6xxx	Dissertation	-
	Spring Semester	
CSC 6xxx	Dissertation	-

All courses may not be offered every year. Alternate courses may be substituted as and when required.

18- List of Electives is given in Appendix B.
*- The course of Research Methodology is compulsory if not done earlier in Masters.

2.1 Doctor of Philosophy in Computing (PhD Computing)

Compulsory Courses

Course Name	Research Methodology	**Credit Hours**	**3**(3,0)
Course Code	CSC 6101	**Prerequisite(s)**	None

Course Description	This course covers international ethical, professional and legal issues in computing research including concept of research, definitions, quantitative and qualitative approaches, proposal for research, forming hypotheses, originality, critical analysis methods; also reading for research; data collection, information gathering; literature surveys and questionnaires data analysis, presentation of information, writing academic papers, content and referencing. The students have to perform meta analyses of 25-30 research papers selected in current research topics in International Journals. Topic and papers are selected with approval from the instructor. Conference papers are not allowed for review. Students have to read all such papers and prepare the analysis related to model, methods, findings and come up with what has been done related to selected area of research and research gaps if any are explicitly identified with future work.
Equivalent Course(s)	None

21. Doctor of Philosophy in Computing (PhD Computing)

Department of Mechatronics Engineering

5.1 Bachelor of Engineering

5.1.1 Bachelor of Engineering in Mechatronics Engineering (BEME)

Students enrolled in the Bachelor of Engineering in Mechatronics (BEME) program, are required to complete 48 courses with a total of 140 credit hours and an Internship, within seven (7) years, to be eligible for BE (Mechatronics) degree. A non-credited Community Service Learning Course will be offered at the end of 4th semester. The following is the break-up of the 48 courses:

- *42 Compulsory Courses (123 Credit Hours)*
- *4 Electives[19] (11 Credit Hours)*
- *Final Year Project (6 Credit Hours) (to be completed in 7th & 8th semesters)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
ME 1101	Communication and Presentation Skills	136
ME 1111	Electric Circuits	136
ME 1104	Engineering Mathematics-I: Calculus and Analytical Geometry	136
ME 1106	Islamic Studies	137
ME 1109	Engineering Drawing-I	137
ME 1203	Engineering Physics	137
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ME 1201	Electronic Devices and Circuits	138
ME 1202	Engineering Mathematics-II: Linear Algebra and Ordinary Differential Equations (ODES)	138
ME 1204	Engineering Statics	138
ME 1207	Engineering Workshop	139
ME 1209	Computer Programming	139
ME 2306	Pakistan Studies	139
ME 2xxx	Social Sciences Elective	-
	Second Year	
	Fall Semester	
ME 2302	Digital Logic Design	139
ME 2303	Engineering Dynamics	140
ME 2304	Engineering Mathematics-III: 3-D Geometry and Vector Calculus	140
ME 2311	Network Analysis	140
ME 2312	Data Structures and Object-Oriented Programming	140
ME 2309	Engineering Drawing-II	141
ME 2405	Thermodynamics	141
	Spring Semester	
ME 2401	Electronics Circuit Design	141
ME 2403	Engineering Mathematics-IV: Transformation Techniques	141
ME 2409	Strength of Materials	142
ME 2407	Actuating Systems	142
ME 2408	Signals and Systems	142
ME 3607	Solid Modeling	142
ME 2310	Community Service Learning	143

19- List of Electives is given in Appendix B.

*To be continued and final grades will be awarded at the end of 8th Semester.

*To be continued from 7th semester and final grades will be awarded at the conclusion of 8th Semester.
All courses may not be offered every year. Alternate courses may be substituted as and when required.

Compulsory Courses

Course Name	Communication and Presentation Skills	**Credit Hours**	**2** (2,0)
Course Code	ME 1101	**Prerequisite(s)**	None

Course Description

This course is aimed at improving English language communication and presentation skills of students. With a multidimensional approach, the course enables the students to practice the use of English in everyday situations, building upon all four skills: listening, speaking, reading and writing. It prepares them to participate in seminars and discussions and make effective presentations, with an awareness of the audience and effective use of verbal and non-verbal communication. The course addresses the basic English language issues faced by the learners, while also aiming to foster in them critical skills to develop a concise and clear argument, respond to others' comments and negotiate their own point of view persuasively. The course uses an interactive, participatory methodology, to engage learners' interest and boost their confidence to use English in everyday communication in formal and informal contexts.

Equivalent Course(s)

CSC 2101, MD 1122, SS 1116, BIO 1111 AF 1203, EN 1106

Course Name	Electric Circuits	**Credit Hours**	**3** (2,1)
Course Code	ME 1111	**Prerequisite(s)**	None

Course Description

This course aims to explain the working principles of resistors, capacitors and inductors in terms of voltage and current. Ohm's law, Kirchhoff's Current Law (KCL) and Kirchhoff's Voltage Law (KVL) are explained in detail. Each discussion on theory is supplemented with appropriate lab experiment. This course prepares students for more advanced courses in electronic engineering to be followed in subsequent semesters.

Equivalent Course(s)

None

Course Name	Engineering Mathematics-I: Calculus and Analytical Geometry	**Credit Hours**	**3** (3,0)
Course Code	ME 1104	**Prerequisite(s)**	None

Course Description

The course begins with a review of vector algebra and trigonometry; then limits and continuity are introduced. With the knowledge of limits and continuity the students develop the concept of the derivative and its applications. At the end, the students study the anti-derivative of elementary functions and applications of the definite integral in geometry, science, and engineering.

Equivalent Course(s)

CSC 1101, BA 2404

Course Name	Islamic Studies	**Credit Hours**	**2** (2,0)
Course Code	ME 1106	**Prerequisite(s)**	None

Course Description

Islamic Studies gives an introduction to basic principles of Islam, followed by topics, such as; Ibadaat (Worship), Amr Bil Maroof wa Nahi anl Munkir (i.e. commands and prohibition) , Islam's concept of knowledge, comparison with science, life history of the Prophet Muhammad (Peace and Blessings of Allah be upon Him), unity of Ummah; Kasb-e-Halal (lawful earning) and obligations of a Muslim. In addition, fundamental human rights and minorities, Islamic society, maintaining identity in a non-Islamic state, Islamic politics, and problems faced by Muslims and the status of women in Islam, are also being covered.

Equivalent Course(s)

BTC 1102

Course Name	Engineering Drawing-I	**Credit Hours**	**2** (0,2)
Course Code	ME 1109	**Prerequisite(s)**	None

Course Description

Drawings are means of communication for engineers. During this course this is accomplished through sketching, use of instruments and knowledge of orthographic projection. Initially students are introduced to engineering drawing basics, such as types of lines, lettering, dimensioning, use of pencil and drawing instruments, and planning of drawing sheet. Then students are given practice of making engineering drawings of different objects. Furthermore, students are also made to practice orthographic projections drawing in first and third angles. This helps them in understanding the engineering drawings and then making and modifying them efficiently.

Equivalent Course(s)

None

Course Name	Engineering Physics	**Credit Hours**	**3** (2,1)
Course Code	ME 1203	**Prerequisite(s)**	None

Course Description

The main objective of this course is to develop an understanding of physical processes which govern the nature. Emphasis is given to certain key branches in physics like mechanics, fluids, heat, electromagnetism, and material/energy properties in a given environment. This constructs a firm base for the courses in future semesters.

Equivalent Course(s)

None

Course Name	Electronic Devices and Circuits	**Credit Hours**	**4** (3,1)
Course Code	ME 1201	**Prerequisite(s)**	ME 1102, ME 1111

Course Description

This course is an introduction to electronic circuits. It explains the basic concepts of semi-conductor diode, its current-voltage relationship and various applications of junction diode, and Bipolar Junction Transistor and Field-Effect Transistor are evolved as two PN-junction devices. In addition, relations of various currents and voltages in these transistors are explained in detail, and effect of temperature on these semiconductor devices is highlighted. A variety of applications of various types of transistors, amplifiers and power supplies are discussed in this course.

Equivalent Course(s) None

Course Name	Engineering Mathematics-II: Linear Algebra and Ordinary Differential Equations (ODES)	**Credit Hours**	**3** (3,0)
Course Code	ME 1202	**Prerequisite(s)**	ME 1104

Course Description

The first half of the course covers topics such as; linear algebra, systems of linear algebraic equations, vector spaces, linear dependence, bases, dimension, matrix algebra, determinants, eigenvalues, and eigenvectors. The second half covers; ordinary differential equations, including solutions to separable and linear first order equations, and higher order linear equations with constant coefficients.

Equivalent Course(s) CSC 2206

Course Name	Engineering Statics	**Credit Hours**	**3** (3,0)
Course Code	ME 1204	**Prerequisite(s)**	None

Course Description

This course provides a basic understanding of the part of mechanics which is concerned with the equilibrium of bodies under the action of forces. It lays the foundation and framework for subsequent courses, namely Engineering Dynamics and Mechanics of Materials. The topics include: basic concepts of mechanics and vectors, free-body diagrams and equilibrium of particles, free-body diagrams and equilibrium of rigid bodies, force systems, analysis of trusses, beams and frames, distributed forces, friction and application of frictional forces.

Equivalent Course(s) None

Course Name	Engineering Workshop	**Credit Hours**	**2** (0,2)
Course Code	ME 1207	**Prerequisite(s)**	None

Course Description

Engineering Workshop course introduces students to various engineering processes in electrical and mechanical workshops. The electrical workshop would further include the hardware and software interfacing and the electro-mechanical project. Whereas, the mechanical workshop would elaborate on the wood working shop, metal work, welding shop, fitting shop and machine shop.

Equivalent Course(s) None

Course Name	Computer Programming	**Credit Hours**	**2** (0,2)
Course Code	ME 1209	**Prerequisite(s)**	None

Course Description

Computer Programming teaches the basics of C Programming Language. The topics include: C (variable, data type, arithmetic operations), expressions and operators, decisions (conditional statement, flowcharting, if/else structure, logical operators), loops, over flow conditions, properties of while loop, do while loop, switch statements, functions, arrays and their initializations, copying and linear structures.

Equivalent Course(s) CSC 1103

Course Name	Pakistan Studies	**Credit Hours**	**2** (2,0)
Course Code	ME 2306	**Prerequisite(s)**	None

Course Description

This course is oriented towards developing better understanding of Pakistan with a critical perspective. History, economics, constitutional development, cultural and social integration, as well as the study of the foreign policy forms a major part of the course.

Equivalent Course(s) BTC 2407

Course Name	Digital Logic Design	**Credit Hours**	**3** (2,1)
Course Code	ME 2302	**Prerequisite(s)**	ME 1102, ME 1111

Course Description

This course teaches theoretical concepts, well-supported through practical work, the systematic synthesis of the applied techniques for the design of practical digital systems. Topics include; introduction to various numbering systems, various design techniques, minimization techniques for designing efficient combinational and sequential logic circuits, basic digital circuit building blocks, such as, decoders, multiplexers, shift registers, flip flops, etc. Modern methods of designing digital circuits. Designing of autonomous and input-controlled counters & shift-registers, and concept of finite state machine.

Equivalent Course(s) CSC 2103

Course Name	Engineering Dynamics	**Credit Hours**	**3** (3,0)
Course Code	ME 2303	**Prerequisite(s)**	ME 1204

Course Description

During this course, students are explained the concepts of kinematics of particle motion in various coordinate systems as well as relative and constrained motion. This helps in understanding the forces being applied on a system in motion. Students are further exposed to particles kinetics which include; the force mass acceleration, work–energy and impulse momentum. These help students in strengthening concepts related to bodies in motion.

Equivalent Course(s) None

Course Name	Engineering Mathematics-III: 3-D Geometry and Vector Calculus	**Credit Hours**	**3** (3,0)
Course Code	ME 2304	**Prerequisite(s)**	ME 1104

Course Description

This course is designed to introduce the concepts of vector-valued functions, functions of several variables, partial derivatives, multiple integrals, and vector analysis. Also, applications to geometry and physics, as well as other real-life problems are particularly emphasized in the course, e.g., surface areas or volumes of 3D objects, gradient or divergence of vector fields, etc.

Equivalent Course(s) None

Course Name	Network Analysis	**Credit Hours**	**2** (2,0)
Course Code	ME 2311	**Prerequisite(s)**	ME 1111

Course Description

This course focuses on the analysis and circuit's response of first and second order circuits by formulation of the differential equation of the circuit and its solutions for DC and AC Forcing functions. The concept of phasors and Laplace transformation are introduced as a tool to solve the circuit equations in Laplace and phasor domains. The course also covers the frequency response of a circuit through sinusoidal analysis.

Equivalent Course(s) None

Course Name	Data Structures and Object-Oriented Programming	**Credit Hours**	**2** (0,2)
Course Code	ME 2312	**Prerequisite(s)**	ME 2301

Course Description

This course introduces students to the concepts of object-oriented programming like classes, objects, abstraction, polymorphism, encapsulation, inheritance, etc. The course also reinforces students understanding of basic programming principles and fundamentals of procedural programming.

Equivalent Course(s) CSC 1208

Course Name	Thermodynamics	**Credit Hours**	**3** (2,1)
Course Code	ME 2405	**Prerequisite(s)**	ME 2303

Course Description

This course gives introduction to basic laws of thermodynamics and control volume analyses; properties and behavior of pure substances; application to thermodynamic systems operating in steady state and transient processes, heat transfer mechanisms, typical power producing cycles and refrigerators. Towards the end of the course, students are introduced to Refrigeration, heat pump systems, combustion and fuel cells.

Equivalent Course(s) None

Course Name	Engineering Drawing-II	**Credit Hours**	**1** (0,1)
Course Code	ME 2309	**Prerequisite(s)**	ME 1109

Course Description

Initially students are introduced with the basic AutoCAD commands and computer-aided-drafting concepts to draw, design, and draft. Emphasis is placed on efficient and accurate drawing techniques incorporating the features, commands, and techniques for creating, editing, and printing 2D production drawings. During the latter part of the course students will create several mechanical CAD drawings following the ANSI (American Standards Institute) and ISO (International Standards Organization) standards.

Equivalent Course(s) None

Course Name	Electronics Circuit Design	**Credit Hours**	**4** (3,1)
Course Code	ME 2401	**Prerequisite(s)**	ME 1201

Course Description

This course contributes to both the engineering aspects and design components. The course has been designed with consideration to single and multi-device sub-circuits, frequency response characteristics, and feedback, stability, efficiency, and IC techniques. It is a prerequisite to senior-level electronic design courses.

Equivalent Course(s) None

Course Name	Engineering Mathematics-IV: Transformation Techniques	**Credit Hours**	**3** (3,0)
Course Code	ME 2403	**Prerequisite(s)**	ME 1202

Course Description

The course covers the advanced topics in mathematics, applicable to engineering problems. Topics include; complex variable analysis, and Fourier analysis including complex Fourier series, complex Fourier integral, Fourier transforms and discrete Fourier transform.

Equivalent Course(s) None

Course Name	Strength of Materials	**Credit Hours**	**4** (3,1)
Course Code	ME 2406	**Prerequisite(s)**	ME 1204

Course Description

This course is a foundation to many advanced techniques that allow engineers to design structures, predict failures and understand the physical properties of materials. This course provides basic tools for stress, strain and strength analysis. Furthermore, methods for determining the stresses, strains and deflections produced by applied loads are taught. In summary, engineering design concepts are integrated into the Strength of Materials course.

Equivalent Course(s) None

Course Name	Actuating Systems	**Credit Hours**	**4** (3,1)
Course Code	ME 2407	**Prerequisite(s)**	ME 2311

Course Description

The objective of this course is to get the students familiarize with the basic principles of actuating systems including: solenoids, dc motors and ac motors (synchronous and asynchronous). Furthermore, other actuating systems using hydraulics and pneumatics principles will also be explained. The course includes several lab experiments to explain the theoretical aspect.

Equivalent Course(s) None

Course Name	Signals and Systems	**Credit Hours**	**2** (2,0)
Course Code	ME 2408	**Prerequisite(s)**	None

Course Description

This course would develop a good understanding about Signals and Systems as they occur in various domains. Various Signal Transformations and associated mathematical representations would be elaborated. It would help develop expertise to model, analyze and process signals as it occurs in different domains.

Equivalent Course(s) None

Course Name	Solid Modelling	**Credit Hours**	**1** (0,1)
Course Code	ME 3607	**Prerequisite(s)**	ME 2309

Course Description

This course is taught with a combination of theory and practice. Alongside with the theory, the course requires a student to undertake assignments using major commercial softwares. Throughout the course intensive hand-on training on leading commercial CAD packages is provided to enable students to develop the knowledge of the complete concept from 3D Solid Modelling.

Equivalent Course(s) None

Course Name	Community Service Learning	**Credit Hours**	**2** (1,1) Non-Credit Course
Course Code	ME 2310	**Prerequisite(s)**	None

Course Description

It is expected that at the end of the course the students not only become aware of various areas of community services and of various philanthropic activities undergoing in the community but also be able to develop the civic sense, be compassionate and responsible towards the community.

Equivalent Course(s) SS 1115

Course Name	Engineering Mathematics-V: Numerical Methods	**Credit Hours**	**3** (3,0)
Course Code	ME 3501	**Prerequisite(s)**	ME 1202

Course Description

This course introduces students to a variety of numerical methods and application of these methods to solve a broad range of engineering problems. The course covers fundamental principles regarding types of computational errors, and propagation of errors. The numerical methods include finding zeros of functions, solving systems of linear equations, interpolation and approximation of functions, numerical integration and differentiation, and solving initial value problems of ordinary differential equations.

Equivalent Course(s) None

Course Name	Fluid Mechanics	**Credit Hours**	**4** (3,1)
Course Code	ME 3502	**Prerequisite(s)**	ME 2405

Course Description

This course introduces students to the concepts, principles, laws, observations, and models of fluids at rest and in motion. The basic idea of what fluids are, the study of static fluids, the use of control volumes for fluids in motion, and the uses of length, mass, time and temperature dimensions to greatly simplify the description of fluids are illustrated. During the latter part of the course attention is paid to application of hydraulics and pneumatics in Mechatronics systems.

Equivalent Course(s) None

Course Name	Microprocessor and Microcontroller Based Systems	**Credit Hours**	**3** (2,1)
Course Code	ME 3509	**Prerequisite(s)**	ME 2302

Course Description

Microcontroller-Based Systems emphasizes on the practical applications of microcontrollers for a variety of products in various fields. It teaches to perform analysis requirement of a given task, making decisions in selecting an appropriate controller, designing, implementing and fully testing the hardware and software part of the product. Furthermore, the course covers programming the microcontroller using assembly code instructions, programming the microcontroller using C/C++ in integrated development environment. The course is heavily based on practical work.

Equivalent Course(s) None

Course Name	Materials and Manufacturing Processes	**Credit Hours**	**3** (3,0)
Course Code	ME 3506	**Prerequisite(s)**	None

Course Description

This course introduces student to the structures and properties of metals, ceramics, polymers, and composites, with an understanding of the processing and design limitations of contemporary materials, as well as to new classes of materials being developed to meet the ever-expanding range of material requirements. In the later part of the course, students are introduced to different manufacturing processes used in the industry.

Equivalent Course(s) None

Course Name	Theory of Machines	**Credit Hours**	**3** (2,1)
Course Code	ME 3507	**Prerequisite(s)**	ME 2303

Course Description

The objective of this course is to introduce the preliminary concepts of mechanisms and to present methods of analysis for the motion and force transmission in mechanisms. This course enables students to understand various independent technical approaches that exist in the field of mechanisms, kinematics and machine dynamics.

Equivalent Course(s) None

Course Name	Instrumentation and Measurements	**Credit Hours**	**4** (3,1)
Course Code	ME 3508	**Prerequisite(s)**	ME 2407

Course Description

This course covers the operating principles of various types of sensors and introduces the concepts & designs of instruments for the measurement of electrical and non-electrical quantities. Upon completion of this course, along with its lab sessions, students will also be able to select, interface and calibrate various types of sensors or instruments.

Equivalent Course(s) None

Course Name	Control Systems	**Credit Hours**	**4** (3,1)
Course Code	ME 3602	**Prerequisite(s)**	None

Course Description

In this course students, initially are taught how to model linear time-invariant electrical, mechanical, and electro-mechanical systems. Then, students are taught to analyze the behavior of the above-mentioned systems in time and frequency domains and recognize the performance characteristics of a control system such as stability, damping, phase and gain margins. Subsequently, the students learn to analyze the performance of proportional, derivative and integral feedback controllers and design simple control systems that satisfy given criteria. Finally, students are introduced to modern state-space-based control system analysis and design techniques. The students also use industry standard software tools such as Matlab to analyze, design, and evaluate control systems.

Equivalent Course(s) CSC 4705

Course Name	Engineering Mathematics-VI: Probability and Statistics	**Credit Hours**	**3** (3,0)
Course Code	ME 3603	**Prerequisite(s)**	ME 1104

Course Description

Engineering Mathematics-VI covers data and types, sampling techniques, group and ungroup data, measure of dispersion, mathematical and statistical functions, multiple linear regressions, laws of probability, probability distribution-binomial, probability distribution-normal, probability distribution-poisson, steps involved in hypothesis analysis, quality control, control chart, acceptance sampling, errors and rectification, goodness of fit, Chi-square test and curve fitting.

Equivalent Course(s) CSC 2105

Course Name	Machine Design	**Credit Hours**	**3** (3,0)
Course Code	ME 3604	**Prerequisite(s)**	ME 2303

Course Description

This course aims to synergize forces, moments, torques, stress and strength information to develop ability to analyze, design and/or select machine elements - with attention to safety, reliability, and societal and fiscal aspects. Finally, the course prepares the students to design static and dynamic machine elements such as shafts, springs, screws, bearings and gears.

Equivalent Course(s) None

Course Name	Power Electronics	**Credit Hours**	**4** (3,1)
Course Code	ME 3605	**Prerequisite(s)**	ME 2401

Course Description

The objective of the course is to expose students to electric power conversion i.e. from AC to DC and DC to AC. Special semiconductor devices like Thyristors, Silicon controlled rectifiers etc. are fully explained. The course also covers choppers, regulators and phase-controlled circuits. The course is supplemented with experiments to give students hands-on-practice for developing a thorough understanding of the subject.

Equivalent Course(s) None

Course Name	Mechatronics System Design	**Credit Hours**	**4** (3,1)
Course Code	ME 4705	**Prerequisite(s)**	ME 2407, ME 3508

Course Description

This course provides the essentials of digital control as applied to high-speed mechanical systems. The approach is both theoretical and practical in providing the optimal software and/or hardware control solution. Project work will include mechatronics integration of mechanical, electrical, microprocessor, micro-controller and software components including programming within engineering systems.

Equivalent Course(s) None

Course Name	Technopreneurship	**Credit Hours**	**2** (2,0)
Course Code	ME 3608	**Prerequisite(s)**	None

Course Description

This course introduces engineering students to the concepts and practices of technology entrepreneurial thinking and entrepreneurship. Using lectures, case studies, business plans, and student presentations, the course teaches life skills in entrepreneurial thought and action that students can utilize in starting technology companies or executing R&D projects in companies.

Equivalent Course(s) CSC 4816

Course Name	Engineering Economics and Project Management	**Credit Hours**	**3** (3,0)
Course Code	ME 4702	**Prerequisite(s)**	None

Course Description

Engineering Economics and Project Management covers; basic economic concepts, such as types of costs, cash flow diagrams, market mechanism, equivalence, project feasibility analysis, equity versus debt financing, depreciation accounting, consumer demand and elasticity, and cost benefit analysis. Further, general project management skills and techniques are also covered.

Equivalent Course(s) PM 5102, BA 4814

Course Name	Final Year Project I & II	**Credit Hours**	**6** (0,6)=(0,3)+(0,3)
Course Code	ME 4708 and ME 4808	**Prerequisite(s)**	None

Course Description

Final Year Project is a group project requiring designing of a Mechatronics product or application. Each group consists of two to four students the project is stretched over two semesters (i.e. the seventh and the eighth). A midterm evaluation is carried out in the summer semester in the presence of the department's faculty. Towards the end of the eighth semester, each group is required to submit a report according to the university's report format and present the final project.

Equivalent Course(s) None

Course Name	Professional Practices	**Credit Hours**	**2** (2,0)
Course Code	ME 4706	**Prerequisite(s)**	None

Course Description

This course provides students with an introduction to the issues in engineering ethics. It places those issues within a philosophical framework, and it seeks to exhibit their social importance and intellectual challenge. The goal is to stimulate reasoning and to provide students with the conceptual tools necessary for responsible decision making.

Equivalent Course(s) None

Course Name	Technical Writing Skills	**Credit Hours**	**2** (2,0)
Course Code	ME 1205	**Prerequisite(s)**	None

Course Description

This course focuses on the use of English in professional contexts. The course aims to develop interpersonal communication skills in a dynamic, digitalized and globally connected business world. This interactive course will create an awareness in the students about the basics of communication in formal contexts, allows them to analyze the mechanics of technical business writing with the use of specific registers, and experiment with different types of letters, memos, reports, proposals, presentations, and manuals to communicate complex information with clarity, conciseness, and force to meet the basic business communication needs of working professionals.

Equivalent Course(s) CSC 1205, BA 1105, MD 1222, SS 2316, BIO 1211, BTC 1202

Course Name	Robotics	**Credit Hours**	**4** (3,1)
Course Code	ME 4802	**Prerequisite(s)**	ME 2303

Course Description

During this course a detailed study of robotics is undertaken with emphasis on homogeneous transformations, kinematics, force and velocity transformation, end effectors and the interpretation of sensory information. The course is designed to explore the current and future use of automation technology in industry and everyday use. The students will receive a comprehensive overview of robotic systems and the subsystems that comprise them.

Equivalent Course(s) None

Course Name	Finite Element Analysis	**Credit Hours**	**3** (0,0)
Course Code	ME 4xxx	**Prerequisite(s)**	ME 3601

Course Description

The course will equip students with the necessary knowledge to use finite element analysis to solve problems related to solid mechanics, dynamics and heat-transfer. FEA is a design/research tool that is extensively used in industry and research institutions. Students will also gain hands-on experience in using finite element analysis software ANSYS/Solid-works to solve realistic engineering problems.

Equivalent Course(s) None

Course Name	Heat Transfer	**Credit Hours**	**3** (2,1)
Course Code	ME 4703	**Prerequisite(s)**	ME 3502

Course Description

This course is meant to study the three fundamental modes of heat transfer: conduction, convection, and radiation. A physical interpretation of the many quantities and processes in heat transfer using numerical methods to solve practical problems. Fundamentals of heat transfer are applied to the analysis and design of heat exchangers and other applications.

Equivalent Course(s) None

Course Name	Manufacturing Automation	**Credit Hours**	**4** (2,1)
Course Code	ME 48xx	**Prerequisite(s)**	ME 4705

Course Description

This course introduces the student to practical methods of automatic control of machines, processes and systems. This course primarily covers manufacturing automation with reference to CNC and PLC. The course also includes familiarization with PLCs, covering programming of some popular PLCs used in the industry. Towards the end of the course, an introduction to industrial robots and their application is covered.

Equivalent Course(s) None

5.2 Master

5.1.1 Master of Science in Mechatronics Engineering (MSME)

SZABIST offers Master of Science in Mechatronics Engineering (MSME) degree with two specializations; namely: Robotics & Industrial automation and Smart Electromechanical Systems. The program is of 2-year duration and is offered in the evening. It requires 30 credit hours to complete the degree with 8 courses (24 credit hours) and Thesis/Research Work (6 credit hours) in not more than four (4) years.

The following is the break-up of the minimum credit hours requirements to be fulfilled by the students enrolled in this program:

- *5 Core Courses (15 Credit Hours)*
- *3 Electives[20] (9 Credit Hours)*
- *Thesis/Research Project or (2 Electives in lieu of Thesis/Research Project) (6 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
ME-5102	Advanced Robotics	150
ME-5101	Advanced Embedded Systems	150
ME-5105	Research Methodology	150
	Spring Semester	
ME-5202	Image Processing for Intelligent Systems	150
ME-5201	Data Acquisition and Control	151
ME-5xxx	Elective-I	-
	Second Year	
	Fall Semester	
ME-5xxx	Elective-II	-
ME-5xxx	Elective-III	-
	Spring Semester	
ME-5xxx	Electives IV / Thesis	-
ME-5xxx	Electives V / Thesis	-

All courses may not be offered every year. Alternate courses may be substituted as and when required.

20- List of Electives is given in Appendix B.

Compulsory Courses

Course Name	Advanced Robotics	**Credit Hours**	**3** (3,0)
Course Code	ME 5102	**Prerequisite(s)**	None
Course Description	The course will mainly cover geometry and mathematical representation of rigid body motion; forward and inverse kinematics of articulated mechanical arms; trajectory generation, splines, interpolation; manipulator dynamics; position sensing, actuation and fundamentals of manipulator control.		
Equivalent Course(s)	None		

Course Name	Advanced Embedded Systems	**Credit Hours**	**3** (3,0)
Course Code	ME 5101	**Prerequisite(s)**	None
Course Description	The course is intended to give detailed explanation of processor architecture and design, memory access, programming of embedded systems and integration of embedded systems in real time environment. An overview of programmable logic devices and system on chip will also be given along with IC fabrication and design challenges.		
Equivalent Course(s)	None		

Course Name	Research Methodology	**Credit Hours**	**3** (3,0)
Course Code	ME 5105	**Prerequisite(s)**	None
Course Description	This course introduces the Research Process to students. It covers review of technical publications and journals, research problem formulation, research methodologies and article drafting. The students are required to undertake a research project that would result in an IEEE style formatted article.		
Equivalent Course(s)	None		

Course Name	Image Processing for Intelligent Systems	**Credit Hours**	**3** (3,0)
Course Code	ME 5202	**Prerequisite(s)**	None
Course Description	This course presents the theory and practice of digital image processing with Matlab. Numerous examples and practical hands-on exercises are included in the course. One major topic of image processing is covered in every lecture and it typically consists of a discussion of the basic theoretical concepts and some examples illustrating practical imaging problems.		
Equivalent Course(s)	None		

Course Name	Data Acquisition and Control	**Credit Hours**	**2** (2,0)
Course Code	ME 5201	**Prerequisite(s)**	None

Course Description

The course is intended to give detailed explanation of passive and active electrical transducers, signal conditioning circuits along with digital interfacing techniques. An overview of digital control systems and digital controller design will also be given.

Equivalent Course(s)

None

Department of Social Sciences

3.1 Bachelor of Science

3.1.1 Bachelor of Science in Social Sciences (BSSS)

Students enrolled in Bachelor of Science in Social Sciences (BSSS) program are required to complete a total of 144 credit hours within seven (7) years. The course break-up is as follows

- *32 Compulsory Courses (96 Credit Hours)*
- *12 Major Courses[21] (36 Credit Hours)*
- *2 Electives[22] (6 Credit Hours)*
- *1 Research Project (6 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
SS 1117	Computer and Web Skills	156
SS 1116	English for General Purposes (EGP)	156
SS 1109	Islamiat / Ethics and Pakistan Studies	156
SS 1105	Microeconomics	157
SS 1115	Community Services	157
SS 1201	Introduction to Social Sciences	157
	Spring Semester	
SS 2306	Psychology	157
SS 1205	Macroeconomics	158
SS 2307	Sociology	158
SS 1155	Introduction to Political Science	158
SS 2412	International Relations	158
SS xxxx	Introduction to Indus Civilization	159
	Second Year	
	Fall Semester	
SS 2314	Study of Anthropology	159
SS 2316	English for Academic Purposes (EAP)	159
SS 2313	Introduction to Social Psychology	160
SS 2318	Mathematics and Statistics	160
SS 2413	Philosophy	160
SS 1xxx	Elective-I	-
	Spring Semester	
SS 2406	Gender Studies	161
SS 2418	Statistical Inferences	161
SS 2414	Introduction to Organizational Psychology	161
SS 3503	Development Studies	161
SS 1209	Social Policy	162
SS 1xxx	Elective-II	-

21- List of Major Courses is given in Appendix C.
22- List of Electives is given in Appendix B.

3.1.1 Bachelor of Science in Social Sciences (BSSS)

Course Code	Course Title	Page #
	Third Year	
	Fall Semester	
SS 2312	Culture, Art and Society	162
SS 3509	Language-I	162
SS 3606	Political Economy	162
SS 4xxx	Major-I	-
SS 4xxx	Major-II	-
SS 4xxx	Major-III	-
	Spring Semester	
SS 3504	Research Methods	163
SS 3605	International Law and Human Rights	163
SS 3609	Language-II	163
SS 4xxx	Major-IV	-
SS 4xxx	Major-V	-
SS 4xxx	Major-VI	-
	Fourth Year	
	Fall Semester	
SS 2411	Environmental Studies	164
SS 4707	Introduction to Health Psychology	164
SS 4709	Research Project-I	164
SS 4xxx	Major-VII	-
SS 4xxx	Major-VIII	-
SS 4xxx	Major-IX	-
	Spring Semester	
SS 4804	Public Policy	164
SS 4809	Research Project-II	165
SS 2405	Enlightenment	165
SS 4xxx	Major-X	-
SS 4xxx	Major-XI	-
SS 4xxx	Major-XII	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

3.1.1 Bachelor of Science in Social Sciences (BSSS)

Compulsory Courses

Course Name	Computer and Web Skills	**Credit Hours**	**3** (3,0)
Course Code	SS 1117	**Prerequisite(s)**	None

Course Description

This course provides understanding on computer systems and their applications. The course focuses on discussing the desktop environment, word processing, spreadsheets, graphics packages, the internet, computer programming, Microsoft Access, Microsoft Visio, html, and webpage developments.

Equivalent Course(s)

BA 1103, BA 1108, CSC 1104, BIO 1104, AF 1102, BST 1102

Course Name	English for General Purposes (EGP)	**Credit Hours**	**3** (3,0)
Course Code	SS 1116	**Prerequisite(s)**	None

Course Description

The course is aimed at improving English language communication and presentation skills of students. With a multidimensional approach, the course enables the students to practice the use of English in everyday situations, building upon all four skills: listening, speaking, reading and writing. It prepares them to participate in seminars and discussions and make effective presentations, with an awareness of the audience and effective use of verbal and non-verbal communication. The course addresses the basic English language issues faced by the learners, while also aiming to foster in them, critical skills to develop a concise and clear argument, respond to others' comments and negotiate their own point of view persuasively. The course uses an interactive, participatory methodology, to engage learners' interest and boost their confidence to use English in everyday communication in formal and informal contexts.

Equivalent Course(s)

ME 1101, MD 1122, CSC 2101, BIO 1111, AF 1203, EN 1106

Course Name	Islamiat/Ethics and Pakistan Studies	**Credit Hours**	**3** (3,0)
Course Code	SS 1109	**Prerequisite(s)**	None

Course Description

This course discusses the fundamental Islamic concepts and a concise history of Pakistan. Topics include pillars of Islam, the Shariah, discourses on Fiqh, the progression of Muslim society (from the advent of Islam up to the independence of the Indian sub-continent), and post-independence events in Pakistan.

Equivalent Course(s)

BA 1106, CSC 1105, MD 2402, BIO 2303, AF 1205

3.1.1 Bachelor of Science in Social Sciences (BSSS)

Course Name	Microeconomics	**Credit Hours**	**3** (3,0)
Course Code	SS 1105	**Prerequisite(s)**	None

Course Description

Microeconomics studies how the individual parts of the economy, the households and the firms, make decisions to allocate limited resources. This course is based on a comprehensive study of the market structures, the product markets and the resource markets. It also deals with application of demand and supply, cost analysis and factors of production.

Equivalent Course(s)

BA 1102, BA 5302, AF 2405, BST 1105

Course Name	Community Services	**Credit Hours**	**3** (3,0)
Course Code	SS 1115	**Prerequisite(s)**	None

Course Description

This course is comprised of two components. First, it introduces students to community-based environment, development and application of social policies, the scope of volunteer work in general and non-governmental organizations (NGOs) in particular, cultural and social aspects of community work, and formulating social processes and procedures. In addition, the second component of this course consist of application of concepts and perspectives learnt in first component. Furthermore, students would be required to engage in a community-based project through an NGO.

Equivalent Course(s)

None

Course Name	Introduction to Social Sciences	**Credit Hours**	**3** (3,0)
Course Code	SS 1201	**Prerequisite(s)**	None

Course Description

This course covers the fundamental concepts of social science, definition of social science, its scope and applicability and the various branches of social sciences.

Equivalent Course(s)

None

Course Name	Psychology	**Credit Hours**	**3** (3,0)
Course Code	SS 2306	**Prerequisite(s)**	None

Course Description

This course covers themes such as introduction to psychology, methods of psychology, biological basis of behavior, sensation, perception, attention, memory, emotions, learning, thinking and individual differences.

Equivalent Course(s)

BA 2312, BIO 2306, MD 2424, BA 2306, AF 2303

3.1.1 Bachelor of Science in Social Sciences (BSSS)

Course Name	Macroeconomics	**Credit Hours**	**3** (3,0)
Course Code	SS 1205	**Prerequisite(s)**	SS 1105

Course Description

This course introduces students to key economic indicators, role of government in an economy, measurement of gross domestic product, components of aggregate demand, consumption function and Keynesian multiplier, investment function, government intervention through monetary and fiscal policies, impact of government intervention on economic activity, inflation and unemployment, aggregate supply and demand, balance of payments and trade, public finance, growth and development.

Equivalent Course(s) BA 5402, BA 1202, BST 1204, AF 3505

Course Name	Sociology	**Credit Hours**	**3** (3,0)
Course Code	SS 2307	**Prerequisite(s)**	None

Course Description

The course covers an overview of sociology. Topics include introduction to sociology, basic concepts of sociology, social groups, culture, Socialization and personality, social control and collective behavior.

Equivalent Course(s) BA 2307, BA 2306, MD 1104, AF 2304

Course Name	Introduction to Political Science	**Credit Hours**	**3** (3,0)
Course Code	SS 1155	**Prerequisite(s)**	None

Course Description

This course provides students introduction to major concept of political systems including system of governance, nature of political and social fabrics. Also, constitutions and rule of business for the success of political system will be taught to students. In addition, different political ideologies and political systems will be part of this course.

Equivalent Course(s) None

Course Name	International Relations	**Credit Hours**	**3** (3,0)
Course Code	SS 2412	**Prerequisite(s)**	None

Course Description

The course introduces students to key issues, questions, and theories about international relations in historical context. Course covers world politics since the First World War, and the lessons learnt by the academic, political, and military elites in the context of international relations since that time. The themes include power politics, liberal internationalism, statecraft, diplomacy, international political economy, international law, international organizations, foreign policy making and policy analysis, security and defense, hegemony and empire, globalization and civil society, and the future of the state.

Equivalent Course(s) None

3.1.1 Bachelor of Science in Social Sciences (BSSS)

Course Name	Introduction to Indus Civilization	**Credit Hours**	**3** (3,0)
Course Code	SS xxxx	**Prerequisite(s)**	None

Course Description

This course is designed to provide an overview of the Indus Valley Civilization from geographic, historical, anthropological, political, economic, and archaeological perspectives. In it, multiple viewpoints via interdisciplinary approaches will be employed to assess the role of culture, literature, ethnomusicology, etc. in the evolution of this world's dynamic civilization. Through lectures and interactive sessions, students will be encouraged to critically analyzed its history while simultaneously challenge the orientalists notions through which it has been usually misconstrued.

Equivalent Course(s) None

Course Name	Study of Anthropology	**Credit Hours**	**3** (3,0)
Course Code	SS 2314	**Prerequisite(s)**	None

Course Description

This course introduces the discipline of Anthropology and its four major fields. It shall be discussed what is the Anthropological understanding of human associations and groups (families, marriages, ethnic and racial groups), and of systems humans have evolved to order their social lives (political, economic systems).

Equivalent Course(s) None

Course Name	English for Academic Purposes (EAP)	**Credit Hours**	**3** (3,0)
Course Code	SS 2316	**Prerequisite(s)**	SS 1116

Course Description

This course is designed to improve academic English language and study skills of students. The course follows a multidimensional approach based on the four language skills with a specific focus on reading and writing skills that are required in research-based study at university level. The course includes listening and note taking skills, library and internet use for locating and evaluating research articles. In addition, the course seeks to enable the students to of speed read, skim, scan and infer from written text. The course specifically focuses on enabling the students to experiment with complex grammatical forms, sentence structures and logical paragraph development, to present coherent, cohesive and effective arguments clearly in research-based writing according to the requirements of their specific discipline.

Equivalent Course(s) MD 1222, ME 1205, CSC 1102, BIO 1211

3.1.1 Bachelor of Science in Social Sciences (BSSS)

Course Name	Introduction to Social Psychology	**Credit Hours**	**3** (3,0)
Course Code	SS 2313	**Prerequisite(s)**	SS 2306

Course Description

The course provides an understanding on how human behavior, feelings and thoughts are affected by social factors of environment and vice versa. Topics include group behavior, social perception, nonverbal behaviors, self-concept, cognitive dissonance, attitudes, conformity, aggression and prejudices.

Equivalent Course(s) None

Course Name	Mathematics and Statistics	**Credit Hours**	**3** (3,0)
Course Code	SS 2318	**Prerequisite(s)**	None

Course Description

This course introduces basic statistical concepts and techniques. Topics include; sampling and experimentation, descriptive statistics, probability, binomial and normal distributions, estimation, single sample and two sample hypothesis tests for means and proportions. Mathematical methods consists of; matrices, system of linear equations, differentiation and optimization, linear programming, and simplex method. Additional topics cover descriptive methods in regression and correlation, or contingency table analysis.

Equivalent Course(s) BA 5305, BA 2305, BIO 1208, BA 2311, BST 1206, AF 2406

Course Name	Philosophy	**Credit Hours**	**3** (3,0)
Course Code	SS 2413	**Prerequisite(s)**	None

Course Description

This course is both an introduction to philosophy and to careful thought, analysis, and argumentation. The course focuses on a general introduction to philosophy, Greek philosophy, medieval era, development of Muslims, Al-Farabi, Al Ghazali, Ibn-e-Rushd, and mystical tradition in Muslim thought, Renaissance, the Enlightenment (Rousseau, Voltaire), German Idealism, modern social philosophers, and contemporary social philosophers.

Equivalent Course(s) None

3.1.1 Bachelor of Science in Social Sciences (BSSS)

Course Name	Gender Studies	**Credit Hours**	**3** (3,0)
Course Code	SS 2406	**Prerequisite(s)**	None
Course Description	This course covers basic concepts, approaches and debates in gender studies. The course introduces gender terms and concepts, the concept of gender division of labour, gender mainstreaming, the effects of development process on women and men and various approaches to gender and development, gender equality and the Millennium Development Goals, definition and explanation of feminism and feminist theory, history of the feminist movements around the world, conceptual development of Muslim feminism and its social, political, economic and legal impact on Muslim countries.		
Equivalent Course(s)	None		

Course Name	Statistical Inferences	**Credit Hours**	**3** (3,0)
Course Code	SS 2418	**Prerequisite(s)**	SS 2318
Course Description	This course covers; sets and probability, concept of random variable, possibilities, theory, estimation theory, testing hypothesis, one sample tests, two sample tests, regression and correlation, analysis of variance, Chi-square distribution, F-distribution, and computer applications.		
Equivalent Course(s)	BA 3605, BA 5405, AF 3506, BST 2306		

Course Name	Introduction to Organizational Psychology	**Credit Hours**	**3** (3,0)
Course Code	SS 2414	**Prerequisite(s)**	SS 2306
Course Description	It is the study of organization, workplace and its employees and how work can be done to enhance the performance and satisfaction of its people. The course discusses hiring and management, job attitudes, leadership, workplace ethics, team composition, job designs, organizational development and human resources.		
Equivalent Course(s)	BA 3504, BA 5207, AF 2305, EN 2306		

Course Name	Development Studies	**Credit Hours**	**3** (3,0)
Course Code	SS 3503	**Prerequisite(s)**	None
Course Description	The course explores the complex and multidimensional nature of development. It covers a broad overview of the development studies, poverty, gender, culture, globalization, empowerment, population, environment and livelihood.		
Equivalent Course(s)	None		

3.1.1 Bachelor of Science in Social Sciences (BSSS)

Course Name	Social Policy	**Credit Hours**	**3** (3,0)
Course Code	SS 1209	**Prerequisite(s)**	SS 2307
Course Description	The course discusses concepts and paradigms of social policy, social policy issues, such as, education, housing, health, corporate social responsibility (CSR), and social service delivery.		
Equivalent Course(s)	None		

Course Name	Culture, Art and Society	**Credit Hours**	**3** (3,0)
Course Code	SS 2312	**Prerequisite(s)**	None
Course Description	In addition to the stylistic and structural components of art, this course includes the historical, social, religious, political, technological, and philosophical issues related to the production and development of art, along with basic understanding of culture and society, globalization of art and culture, media and development of popular culture, alternative cultures subcultures, and public relations.		
Equivalent Course(s)	None		

Course Name	Language-I	**Credit Hours**	**3** (3,0)
Course Code	SS 3509	**Prerequisite(s)**	None
Course Description	This course focuses on the practical and the day-to-day use of the target language in relation to everyday life in the target culture, the communicative approach-working mainly through video documents--offers role-plays, group discussions, listening comprehension exercises as well as written comprehension, and essay-writing.		
Equivalent Course(s)	None		

Course Name	Political Economy	**Credit Hours**	**3** (3,0)
Course Code	SS 3606	**Prerequisite(s)**	None
Course Description	This course adapts an interdisciplinary approach ranging from political science, economics, history, and sociology in order to offer a broad introduction to current issues in political economy. Topics include mercantilism and liberalism , structuralism, the post-structuralism, Marxian definition of capitalism, difference between capitalist class processes (the basis for capitalism) from non-capitalist (slave, feudal, ancient, communal) class processes, international trade , money and debt, global security, knowledge and power, economic integration, development and multinational corporations, food, hunger, and environment.		
Equivalent Course(s)	None		

3.1.1 Bachelor of Science in Social Sciences (BSSS)

Course Name	Research Methods	**Credit Hours**	**3** (3,0)
Course Code	SS 3504	**Prerequisite(s)**	None

Course Description	This course introduces students to the quantitative/qualitative research methods, social research, steps involved in conducting research, sampling, and data collection tools, data collection and processing, data management, data analysis and techniques, and SPSS (Statistical Product and Service Solutions).
Equivalent Course(s)	BA 3603, BA 5206, AF 3609, BST 2301

Course Name	International Law and Human Rights	**Credit Hours**	**3** (3,0)
Course Code	SS 3605	**Prerequisite(s)**	None

Course Description	This course covers origins, content, applications, and ongoing development of human rights principles and doctrines in both international and national politics. Furthermore, this course discusses the historical development of human rights principles and doctrines, including the religious and philosophical ideas that have contributed to their development, the reasons for shifting from moral movements for human rights and national human rights doctrines to the codification of international human rights law. Also, it explains the work of governments, multilateral, and international and local non-governmental organizations in the enforcement of human rights laws, major debates in the field of human rights, including debates over the limits of sovereignty, universality versus relativism, individual versus group rights, and first, second, and third generation rights.
Equivalent Course(s)	None

Course Name	Language-II	**Credit Hours**	**3** (3,0)
Course Code	SS 3609	**Prerequisite(s)**	SS 3509

Course Description	Language-II is the continuation of Language-I to equip students with advanced skills and knowledge to comprehend, speak, read and write competently in real-life situations. Topics include principal of language grammar, elementary communication, language for reading knowledge, and conversation and composition.
Equivalent Course(s)	None

3.1.1 Bachelor of Science in Social Sciences (BSSS)

Course Name	Environmental Studies	**Credit Hours**	**3** (3,0)
Course Code	SS 2411	**Prerequisite(s)**	None

Course Description

This introductory course provides an overview of environmental issues, policy and politics, impact of human activities on natural environment and basic economic and political factors generating environmental crisis. The course covers introduction to environmental issues, foundations of environmental policy and politics, international environmental law and policy, natural resources policy practicum and environmental diplomacy practicum, water resource management, land planning and impact of urban land use planning and transportation on environment, strategies for land conservation, and understanding environmental campaigns, strategies and tactics.

Equivalent Course(s) None

Course Name	Introduction to Health Psychology	**Credit Hours**	**3** (3,0)
Course Code	SS 4707	**Prerequisite(s)**	SS 2306

Course Description

This course helps in identifying behaviors and experiences that promote health, give rise to illness, and influence the effectiveness of health care. Topics include occupational health and public health.

Equivalent Course(s) None

Course Name	Research Project-I	**Credit Hours**	**3** (3,0)
Course Code	SS 4709	**Prerequisite(s)**	SS 3504, SS 2318, SS 2418

Course Description

This course covers research methods application to research report, and research proposal writing, applying a systematic approach to solve problems, analyze, evaluate, and apply relevant information from a variety of sources, and writing accurately, concisely, and logically in American Psychological Association (APA) or Harvard styles.

Equivalent Course(s) None

Course Name	Public Policy	**Credit Hours**	**3** (3,0)
Course Code	SS 4804	**Prerequisite(s)**	SS 1209

Course Description

This course explores both the theoretical and practical aspects of performing policy analysis. The themes of the course include current policy issues from the perspectives of local, state, and federal governments, non-governmental and advocacy organizations, needs and demands for public action, organization and nature of political support, and processes and problems of decision making in major policy areas.

Equivalent Course(s) None

3.1.1 Bachelor of Science in Social Sciences (BSSS)

Course Name	Research Project-II	**Credit Hours**	**3** (3,0)
Course Code	SS 4809	**Prerequisite(s)**	SS 4709

Course Description	This course covers research methods application to research report, and research proposal writing, applying a systematic approach to solve problems, analyze, evaluate, and apply relevant information from a variety of sources, and writing accurately, concisely, and logically in American Psychological Association (APA) or Harvard styles.
Equivalent Course(s)	None

Course Name	Enlightenment	**Credit Hours**	**3** (3,0)
Course Code	SS 2405	**Prerequisite(s)**	SS 2413

Course Description	The course discusses classic Enlightenment texts and writers such as Smith, Diderot, Millar, Schiller, Hume, Kant, and Rousseau. This course explores the ways that contemporary thinkers like Derrida, Foucault, Habermas, Adorno, Lyotard and Luhman have absorbed, engaged and either rejected the Enlightenment completely or attempted to resurrect its more positive and hopeful aspects.
Equivalent Course(s)	None

3.2 Master of Science and PhD

3.2.1 3.2.1 Master of Science in Social Sciences (International Relations, Economics, Psychology & Sociology)

The Master of Science in Social Sciences (International Relations, Economics, Psychology and Sociology) is a 1.5 - 2 years program having two streams i.e. Course Work Based Stream and Research Based Stream. Students enrolled in the either stream of MS SS (International Relations, Economics, Psychology and Sociology) program are required to complete a total of 30 credit hours within four (4) years.

Course Based Stream:

The following is the break-up of the 30 credit hour courses:

- *2 Compulsory Courses (6 Credit Hours)*
- *8 Elective[23] Courses (24 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
SS 5121	Advance Research Methods and Techniques (ARMT)- I (Qualitative)	168
SS 5122	Advance Research Methods and Techniques (ARMT)- II (Quantitative)	168
SS 5xxx	Elective-I	-
SS 5xxx	Elective-II	-
	Spring Semester	
SS 5xxx	Elective-III	-
SS 5xxx	Elective-IV	-
SS 5xxx	Elective-V	-
SS 5xxx	Elective-VI	-
	Second Year	
	Fall Semester	
SS 5xxx	Elective-VII	-
SS 5xxx	Elective-VIII	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

23- List of Electives is given in Appendix. B

3.2.1 Master of Science in Social Sciences (MSSS)

Compulsory Courses

Course Name	Advance Research Methods and Techniques-I (Qualitative)	**Credit Hours**	**3** (3,0)
Course Code	SS 5121	**Prerequisite(s)**	None

Course Description

This course develops critical and practical understandings for evaluating and conducting research from five qualitative research traditions (narrative research, grounded theory, phenomenology, ethnography and case studies). It develops an ethically and procedurally sound qualitative research proposal for qualitative research designs; collect, analyze and interpret qualitative, textual, and other non-traditional forms of data obtained through various tools and sources.

Equivalent Course(s) None

Course Name	Advance Research Methods and Techniques-II (Quantitative)	**Credit Hours**	**3** (3,0)
Course Code	SS 5122	**Prerequisite(s)**	None

Course Description

In this course, concepts, techniques and applications of quantitative methods for decision making are introduced. Topics include: forecasting, regression analysis, analysis of variance, statistical decision theory, utility theory, linear programming, and waiting lines. The course incorporates computer software packages.

Equivalent Course(s) SS 6105, ELM 5102, ELM 6102

3.2 Master of Science and PhD

3.2.2 Doctor of Philosophy in Social Sciences (PhD SS)

For PhD SS Program, Students are required to complete 48 credit hours. 5 courses of 3 credit hours each and one Independent Research Study of 3 Credit Hours (total 18 Credit hours for Course Work) and One dissertation of 30 credit hours (Total 48 Credit Hours for PhD).

- *There are two compulsory courses in PhD i.e. Advanced Research Methods and Techniques (Qualitative) Advanced Research Methods and Techniques (Quantitative).*
- *Students cannot register in IRS before completing compulsory courses.*
- *Candidate may be given prerequisite/deficiency courses or theses which will be decided by the Interview Board at the time of admission.*
- *Prerequisite Courses are non-credit courses.*
- *Dissertation of 30 Credit Hours is Compulsory.*
- *Registration in Dissertation is allowed after passing Comprehensive Examination, GAT- Subject Test and maintaining minimum CGPA requirement.*
- *All the requirements of HEC pertaining to PhD must be fulfilled these are:*
  - *Minimum 60% GAT Subject.*
  - *CGPA requirement (3.00 GPA/CGPA minimum pass requirement for each course and for CGPA).*
  - *Passing Comprehensive examination to establish the PhD candidacy (maximum 2 attempts allowed).*
  - *One Research Paper Published from the thesis in Y-category journal before the completion of 30 Credit Hours Dissertation.*
- *Elective Courses to be selected from the specialized area of International Relations, Economics, Psychology and Sociology.*
- *Maximum Course Load for each Semester is 9 Credit Hours.*
- *Time duration for PhD is Minimum 3 years and Maximum 8 years.*
- *All General guidelines mentioned in DOCTORAL DEGREE PROGRAMS are applicable on PhD-Social Sciences.*

3.2.2 Doctor of Philosophy in Social Sciences (PhD SS)

Course Code	Course Title	Page #
PhD	**First Year**	
	Fall Semester	
SS 6104	Advance Research Methods and Techniques- I (Qualitative)	170
SS 6105	Advance Research Methods and Techniques-II (Quantitative)	170
SS 6xxx	Elective-I	-
	Spring Semester	
SS 6xxx	Independent Research Study	-
SS 6xxx	Elective-II	-
SS 6xxx	Elective-III	-
	Second Year	
	Fall Semester	
SS 6xxx	Dissertation	-
	Spring Semester	
SS 6xxx	Dissertation	-
	Third Year	
	Fall Semester	
SS6xxx	Dissertation	-
	Spring Semester	
SS6xxx	Dissertation	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

3.2.2 Doctor of Philosophy in Social Sciences (PhD SS)

Compulsory Courses

Course Name	Advance Research Methods and Techniques-I (Qualitative)	**Credit Hours**	**3** (3,0)
Course Code	SS 6104	**Prerequisite(s)**	None
Course Description	This course develops critical and practical understandings for evaluating and conducting research from five qualitative research traditions (narrative research, grounded theory, phenomenology, ethnography and case studies). Develops an ethically and procedurally sound qualitative research proposal for qualitative research designs; collect, analyze and interpret qualitative, textual, and other non-traditional forms of data obtained through various tools and sources.		
Equivalent Course(s)	SS 5229, ELM 5102, ELM 6101		

Course Name	Advance Research Methods and Techniques-II (Quantitative)	**Credit Hours**	**3** (3,0)
Course Code	SS 6105	**Prerequisite(s)**	None
Course Description	In this course, concepts, techniques and applications of quantitative methods for decision making are introduced. Topics include; forecasting, regression analysis, analysis of variance, statistical decision theory, utility theory, linear programming, and waiting lines. The course incorporates computer software packages.		
Equivalent Course(s)	SS 5122, ELM 5103, ELM 6102		

Department of Education

7.1.1 Bachelors of Education (B.Ed.) 1.5 Years Secondary

Bachelor of Education (B.Ed.) Secondary is 1.5 years duration program to cater the intellectual and professional needs of pre-service and in-service teachers who have completed 16 years of prior education. Students enrolled in B.Ed. program are required to complete a total of 54 Credit Hours within 4 years.

The break-up of 54 credit hours is as follows:

- *12 Compulsory Courses (36 Credit Hours)*
- *4 Content Specialized Courses[25] (12 Credit Hours)*
- *One Research Project (3 credit hours)*
- *Teaching Practice (3 credit hours)*

Course Code	Course Title	
	First Year	
	Fall Semester	**Page #**
BED 5105	Foundations of Education	173
BED 5102	Educational Leadership and Management	173
BED 5104	Effective Communication in Education	173
BED 5103	Educational Psychology	174
BED 5106	Testing and Evaluation	174
BED 5101	Curriculum Design and Development	174
	Spring Semester	
BED 5201	Academic Content I and Pedagogy	174
BED 5202	Academic Content II and Pedagogy	175
BED 5203	Academic Content III and Pedagogy	175
BED 5204	Academic Content IV and Pedagogy	175
BED 5205	Research Methods and Techniques	176
BED 5206	School, Community and Teacher	176
	Second Year	
	Fall Semester	
BED 5304	ICT in Education	176
BED 5303	Educational Policies and Practices	177
BED 5305	Teaching Practice	178
BED 5302	Critical Thinking and Reflective Practice	177
BED 5301	Classroom Management	177
BED 5308	Research Project	178

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

25-The list of Content Specialized Courses are provided in Appendix-E

7.1.1 Bachelors of Education (B.Ed.) 1.5 Years Secondary

Compulsory Courses

Course Name	Foundations of Education	**Credit Hours**	**3** (3,0)
Course Code	BED 5105	**Prerequisite(s)**	None

Course Description

This course will focus on the ideological, philosophical, psychological, socio-economic and historical foundations of education. The major focus will be on developing an understanding of the participants how different philosophical theories affect education. The course will also include historical development of education of the Pakistan. Emphasize will be given on analyzing various sociological, political, economic and ideological forces that influence the process of education in our culture context. This course will also be used to develop the ability in prospective teachers to interpret knowledge within its historical, philosophical, ideological, and social contexts, which will lead to produce critical perspectives on education both within, and outside of schools.

Equivalent Course(s) EDU 5103

Course Name	Educational Leadership and Management	**Credit Hours**	**3** (3,0)
Course Code	BED 5102	**Prerequisite(s)**	None

Course Description

This course aims to provide students with the opportunity to explore issues linked to effective educational leadership and management. It intends to improve the quality and effectiveness of school management by introducing current methods of educational administration, with a focus on important issues such as cultural influence, power, conflict, time management, and other problems associated with management of teaching and learning. Participants are going to audit their professional skills with an ongoing reflective practice and will identify particular areas for personal and professional development.

Equivalent Course(s) EDU 5107

Course Name	Effective Communication in Education	**Credit Hours**	**3** (3,0)
Course Code	BED 5104	**Prerequisite(s)**	None

Course Description

Leadership competence is the product of communication competence and the communication discipline has experienced a great deal of change and growth over the last fifty years. This course will act as an invitation to join in this debate about the nature, functions, and processes underlying leadership and human communication. It will explore the connection between communication and leadership. Particularly, we will examine how the field of communication contributes to effective teaching and learning. In addition, to adequately understand communication theory one must do practical work in communication as well because leadership is a symbolic process and leaders are made, not born. This class will integrate both theory and practice.

Equivalent Course(s) EDU 5102

7.1.1 Bachelors of Education (B.Ed.) 1.5 Years Secondary

Course Name	Educational Psychology	**Credit Hours**	**3** (3,0)
Course Code	BED 5103	**Prerequisite(s)**	None
Course Description	The purpose of this course is to develop learner's insight. Its unique approach helps students\teachers to understand different psychological concepts by encouraging them to examine their own learning and then showing them how to apply these concepts as teachers. This course concentrates on core concepts and principles. It gives readers an in-depth understanding of the central ideas of educational psychology.		
Equivalent Course(s)	EDU 5302		

Course Name	Testing and Evaluation	**Credit Hours**	**3** (3,0)
Course Code	BED 5106	**Prerequisite(s)**	None
Course Description	This course is designed to develop prospective teachers towards adequate knowledge of the concept of evaluation and test construction during the course. The teacher will develop skills to construct classroom based tests to evaluate students learning outcomes. The learner will also be able to report the result to different stake holders in a professional manner.		
Equivalent Course(s)	EDU 5305		

Course Name	Curriculum Design and Development	**Credit Hours**	**3** (3,0)
Course Code	BED 5101	**Prerequisite(s)**	None
Course Description	The course is designed to develop the theoretical and practical knowledge of participants about issues in curriculum development. The course intends to examine various approaches to curriculum development together with latest trends in curriculum innovation. Moreover, it will highlight the role of teachers in curriculum development and instruction, and distinguish between curriculum assessment and evaluation. The course will also enable participants to design a new curricular unit on the basis of assessment by using an innovative strategy.		
Equivalent Course(s)	EDU 5202		

Course Name	Academic Content-I and Pedagogy	**Credit Hours**	**3**
Course Code	BED 5201	**Prerequisite(s)**	
Course Description	The study of General Science in Primary and Secondary school is linked to National prosperity and economic development. The course is designed for the effective interactive ways of teaching science. The course will highlight the power of observation and inquisitiveness in general sciences studies. It will also focus on how to relate facts, concepts, and theories to every day experience.		
Equivalent Course(s)	EDU 5308		

7.1.1 Bachelors of Education (B.Ed.) 1.5 Years Secondary

Course Name	Academic Content II and Pedagogy	**Credit Hours**	**3** (3,0)
Course Code	BED 5202	**Prerequisite(s)**	None

Course Description

This course is designed to prepare Student/Teachers for teaching mathematics in elementary grades. It provides opportunities for Student/Teachers to strengthen their mathematical knowledge and skills and to gain confidence in their understanding of mathematics. An important outcome of this course for Student Teachers is to be able to teach mathematics successfully in the primary, elementary, and middle grades. Research-based knowledge about good mathematics instruction provides a solid base of information for educators to use as they identify mathematics skills that Student/Teachers need to develop, as well as teaching strategies and instructional approaches that best support the development of these skills. The course design is based on what research tells us about good mathematics instruction. Student Teachers will learn to use a variety of instructional methods that promote active learning of mathematics, including making and using teaching and learning materials. They will plan mathematics lessons and activities, and engage in practice teaching of mathematics.

Equivalent Course(s) EDU 5309

Course Name	Academic Content III and Pedagogy	**Credit Hours**	**3** (3,0)
Course Code	BED 5203	**Prerequisite(s)**	None

Course Description

This course will equip prospective teachers with knowledge and skills to teach social studies in grade I through VIII and Pakistan studies for grade IX and X. They will become familiar with the social studies and Pakistan studies' curriculum and expected student learning outcomes. Prospective teachers will learn to use variety of instructional methods that promote active learning of social studies including making and using teaching and learning materials. They will plan social studies lessons and activities and practice teaching social studies with peers.

Equivalent Course(s) None

Course Name	Academic Content IV and Pedagogy	**Credit Hours**	**3** (3,0)
Course Code	BED 5204	**Prerequisite(s)**	None

Course Description

This course will equip prospective teachers with knowledge and skills to teach English in secondary grades. They will become familiar with the English curriculum and expected student learning outcomes. Prospective teachers will learn the use of different language skills to enhance variety of instructional methods that promote active learning of English, including making and using teaching and learning materials. They will plan English lessons and activities.

Equivalent Course(s) None

7.1.1 Bachelors of Education (B.Ed.) 1.5 Years Secondary

Course Name	Research Methods and Techniques	**Credit Hours**	**3** (3,0)
Course Code	BED 5205	**Prerequisite(s)**	None

Course Description

This course is designed for students to prepare them to situate themselves as researching professionals and at the same time enhance their own professional practice. Students will engage in a critical analysis of different research work and relate it to their own context. The unit provides students with the opportunity to engage with research literature and to establish how different researchers techniques help improve the overall classroom situation.

Equivalent Course(s) EDU 5303

Course Name	School, Community and Teacher	**Credit Hours**	**3** (3,0)
Course Code	BED 5206	**Prerequisite(s)**	None

Course Description

This course is designed to provide an opportunity to develop awareness about linkage among school, community and teacher for effective education program. Through this course the student have an exploration of interaction between teaching and learning within school and community. The course emphasized that how to experience the social contact with the community, and how to mobilize community for the development of the school. The course include a wider issue include culture, gender, special needs, equity and equality and collaborative working condition within the school and community. This course will provide an orientation for the process of socialization and social development. It's also emphasize on social factors which may affect education. This course have not only a theoretical perspective, it has some practical aspects as well like community work, health promotion activities, and promotion of healthy environment.

Equivalent Course(s) EDU 5204

Course Name	ICT in Education	**Credit Hours**	**3** (3,0)
Course Code	BED 5304	**Prerequisite(s)**	

Course Description

Information and Communication Technologies (ICTs) in Education is a broad and constantly changing subject. This course will prepare teachers to understand, use and apply a range of technologies and platforms in teaching and learning, in line with international standards.
With the changing face of technologies and related application, this course will primarily focus on using technologies for learning 'how to learn' to cope with change. It will provide opportunities to prospective teachers to collaborate with students, educators, peers, parents, and global community using digital tools and resources to support learning, success and innovation. Teachers-in-training will engage with the design and creation of exciting, intellectually challenging and authentic learning environments in which ICT changes not only what students learn but also how they learn, as we move forward in the 21st century. Trainees in this course will examine how ICT might be used to both enhance and transform learning.

Equivalent Course(s) EDU 5401, SS 1117

7.1.1 Bachelors of Education (B.Ed.) 1.5 Years Secondary

Course Name	Educational Policies and Practices	**Credit Hours**	**3** (3,0)
Course Code	BED 5303	**Prerequisite(s)**	None

Course Description

The course explores and furthers understanding of reforms in education over the past two decades in Pakistan and South Asia. Through academic readings, the role of educational policies over the years will be analyzed and examined against the backdrop of various political policies in the country. It will also examine how and why particular policy discourses have become accepted in recent years. The course will further consider the implications of policy reforms for practices within educational organizations. The design of this course reflects the view that reforms cannot be comprehended without considering the social, political, economic and historical contexts in which they arise.

Equivalent Course(s) EDU 5301 Educational Policies in Pakistan

Course Name	Critical Thinking and Reflective Practice	**Credit Hours**	**3** (3,0)
Course Code	BED 5302	**Prerequisite(s)**	None

Course Description

This course is aimed at introducing the participants to the concept of reflective practice as a critical process of inquiry and a means to reach new understandings of various disciplines. The reflective input aims to make participants critically reflect and evaluate their own practices and that of other practitioners. In the course, different levels, models and techniques of reflective practice will be discussed. Also, the effectiveness of the role of reflective practice in promoting individual and professional growth will be highlighted through the development of critical thinking skills. Moreover, the participants will interpret critical thinking as a way to acquire knowledge, improve established theories, and strengthen arguments. They will be able to use critical thinking to enhance work processes and improve social institutions. They will practice some of the most central and important skills of critical thinking, and focus on applying those strategies to understanding current issues, belief systems, and ethical positions.Further, through processes of critical inquiries participants will gather evidence of how to enhance the learning capabilities and achievement of their learners.

Equivalent Course(s) EDU 5201 Critical Thinking and Reflective Practices

Course Name	Classroom Management	**Credit Hours**	**3** (3,0)
Course Code	BED 5301	**Prerequisite(s)**	None

Course Description

In this course, prospective teachers will be encouraged to explore their own beliefs about teaching and learning to arrive at a philosophy of classroom management that places learning as an ultimate goal. Prospective teachers will be given the chance to explore curricular concerns of what to teach and how to teach it and to view lesson planning as the consequence of these decisions. They will also study research and best practices on differentiation of instruction, classroom structures, routines, procedures, and community building.

Equivalent Course(s) EDU 5101 Classroom Management

7.1.1 Bachelors of Education (B.Ed.) 1.5 Years Secondary

Course Name	Research Project	**Credit Hours**	**3** (3,0)
Course Code	EDU 5308	**Prerequisite(s)**	Research Method & Techniques (5205)
Course Description	The purpose of this course is to provide teachers with the knowledge and skills to integrate Educational Research as a teaching and problem solving methodology, as well as teaching students to use Research to achieve lesson objectives. This course will be taught by employing the attributes of the Action Research process, which includes: Problem definition, A plan to answer or resolve the problem, Use of objective data, Collection of data, Data recording, and Reporting.		
Equivalent Course(s)	5409 EDU Thesis		

Course Name	Teaching Practice	**Credit Hours**	**3** (3,0)
Course Code	BED 5305	**Prerequisite(s)**	BED 5201 Academic Content-I & Pedagogy BED 5202 Academic Content-II & Pedagogy BED 5203 Academic Content-III & Pedagogy BED 5204 Academic Content-IV & Pedagogy
Course Description	The course is designed to equip prospective teachers with teaching skills in real setting, Teachers will be able to apply and test their knowledge in schools.		
Equivalent Course(s)	Teaching Practices EDU 5403		

7.1 Master of Science and PhD

7.1.1 Master of Science in Educational Leadership and Management (MSELM)

The Master of Science in Educational Leadership and Management (MS ELM) is a 1.5 - 2 years program having two streams i.e. Course Work Based Stream and Research Based Stream. Students enrolled in the either stream of MS ELM program are required to complete a total of 30 credit hours within four (4) years.

Course Based Stream:

The following is the break-up of the 30 Credit Hour courses:

- *2 Compulsory Courses (06 Credit Hours)*
- *8 Elective[26] Courses (24 Credit Hours)*

Research Stream:

The following is the break-up of the 30 Credit Hour courses:

- *2 Compulsory Courses (06 Credit Hours)*
- *6 Elective[27] Courses (18 Credit Hours)*
- *2 Independent Research Studies (IRS)/ 1 Thesis (6 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
ELM 5102	Advanced Research Methods and Techniques (ARMT)-I (Qualitative)	180
ELM 5103	Advanced Research Methods and Techniques (ARMT)-II (Quantitative)	180
ELM 5xxx	Elective-I	-
ELM 5xxx	Elective-II	-
	Spring Semester	
ELM 5xxx	Elective-III	-
ELM 5xxx	Elective-IV	-
ELM 5xxx	Elective-V	-
ELM 5xxx	Elective-VI	-
	Second Year	
	Fall Semester	
ELM5xxx	2 Independent Research Studies/Thesis I (03 credit hours)	-
	Spring Semester	
ELM5xxx	Thesis II (03 credit hours)	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

26- List of Electives is given in Appendix. B
27- List of Electives is given in Appendix. B

7.2.2 Master of Science in Educational Leadership and Management (MSELM)

Compulsory Courses

Course Name	Advanced Research Methods and Techniques-I (Qualitative)	**Credit Hours**	**3** (3,0)
Course Code	ELM 5102	**Prerequisite(s)**	None

Course Description

This course develops critical and practical understandings for evaluating and conducting research from five qualitative research traditions (narrative research, grounded theory, phenomenology, ethnography and case studies). It enables students to develop; ethically and procedurally sound qualitative research proposal for qualitative research designs, collect, analyze and interpret qualitative, textual, and other non-traditional forms of data obtained through various tools and sources.

Equivalent Course(s)

SS 6313, SS 5229, ELM 6101

Course Name	Advanced Research Methods and Techniques-II (Quantitative)	**Credit Hours**	**3** (3,0)
Course Code	ELM 5103	**Prerequisite(s)**	None

Course Description

In this course, concepts, techniques and applications of quantitative methods for decision making are introduced. Topics include: forecasting, regression analysis, analysis of variance, statistical decision theory, utility theory, linear programming, and waiting lines. The course incorporates computer software packages.

Equivalent Course(s)

SS 5122, SS 6105, ELM 6102

7.1 Master of Science and PhD

7.1.1 Doctor of Philosophy in Educational Leadership and Management (PhD ELM)

Students enrolled in the Doctor of Philosophy in Educational Leadership and Management (PhD ELM) program are required to complete a total of 48 credit hours within eight years. The following is the break-up of the 48 credit hour courses:

- *2 Compulsory Courses (6 Credit Hours)*
- *3 Electives[28] (9 Credit Hours)*
- *1 Independent Research Studies (3 Credit Hours)*
- *1 Dissertation (30 Credit Hours)*

Course Code	Course Title	Page #
PhD	**First Year**	
	Fall Semester	
ELM 6101	Advanced Research Methods and Techniques-I (Qualitative)	182
ELM 6102	Advanced Research Methods and Techniques-II (Quantitative)	182
ELM 6xxx	Elective-I	-
	Spring Semester	
ELM 6108	Independent Research Study-I	-
ELM 6xxx	Elective-II	-
ELM 6xxx	Elective-III	-
	Second Year	
	Fall Semester	
ELM 6xxx	Dissertation (Proposal)	-
	Spring Semester	
ELM 6xxx	Dissertation	-
	Third Year	
	Fall Semester	
ELM 6xxx	Dissertation	-
	Spring Semester	
ELM 6xxx	Dissertation	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

28- List of Electives is provided in Appendix B.

7.2.3 Doctor of Philosophy in Educational Leadership and Management (PhD ELM)

Compulsory Courses

Course Name	Advanced Research Methods and Techniques-I (Qualitative)	**Credit Hours**	**3** (3,0)
Course Code	ELM 6101	**Prerequisite(s)**	None

Course Description

This course develops critical and practical understandings for evaluating and conducting research from five qualitative research traditions (narrative research, grounded theory, phenomenology, ethnography and case studies). It enables students to develop; ethically and procedurally sound qualitative research proposal for qualitative research designs, collect, analyze and interpret qualitative, textual, and other non-traditional forms of data obtained through various tools and sources.

Equivalent Course(s)

SS 6313, SS 5229, ELM 5102

Course Name	Advanced Research Methods and Techniques-II (Quantitative)	**Credit Hours**	**3** (3,0)
Course Code	ELM 6102	**Prerequisite(s)**	None

Course Description

In this course, concepts, techniques and applications of quantitative methods for decision making are introduced. Topics include; forecasting, regression analysis, analysis of variance, statistical decision theory, utility theory, linear programming, and waiting lines. The course incorporates computer software packages.

Equivalent Course(s)

SS 5122, SS 6105, ELM 5103

Department of Media Sciences

4.1 Bachelor of Science

4.1.1 Bachelor of Media Science (BMS)

Students enrolled in the Bachelor of Science (Media Science) program are required to complete 45 courses which include a thesis (6 credit hours) within six (6) years. The break-up of the 45 courses, including thesis is as follows:

- *33 Compulsory Courses (99 Credit Hours)*
- *7 Major Requirements[29] (21 Credit Hours)*
- *3 Open Electives[30] (9 Credit Hours)*
- *Thesis[31] I & II (6 Credit Hours)*

29- List of Major Courses is given in Appendix A.
30- List of Electives is given in Appendix B.
31- Guidelines for completion of Thesis are given in Appendix D.

4.1.1 Bachelor of Media Science (BMS)

Course Code	Course Title	Page #
	Third Year	
	Fall Semester	
MD 2423	Theatre Project	193
MD 2424	Media Psychology	193
MD 3523	Production Practices-II	193
MD 2405	Media Laws and Ethics	194
MD 1213	Creative Writing	194
MD 4xxx	Major-I	-
	Spring Semester	
MD 3518	Animation and Motion Graphics	194
MD 4701	State and Nation Building in Pakistan	195
MD 3506	Theories of Visual Culture	195
MD 4xxx	Major-II	-
MD 4xxx	Major-III	-
MD 4xxx	Major-IV	-
	Fourth Year	
	Fall Semester	
MD 4807	Thesis-I	195
MD 4714	Producing Short Narratives	195
MD 4xxx	Major-V	-
MD 4xxx	Major-VI	-
MD 4xxx	Major-VII	-
MD 4xxx	Elective-I	-
	Spring Semester	
MD 4808	Thesis-II	196
MD 4xxx	Elective-II	-
MD 4xxx	Elective-III	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

Compulsory Courses

Course Name	English for General Purposes (EGP)	**Credit Hours**	**3** (3,0)
Course Code	MD 1122	**Prerequisite(s)**	None

Course Description

The course is aimed at improving English language communication and presentation skills of students. With a multidimensional approach, the course enables the students to practice the use of English in everyday situations, building upon all four skills: listening, speaking, reading and writing. It prepares them to participate in seminars and discussions and make effective presentations, with an awareness of the audience and effective use of verbal and non-verbal communication. The course addresses the basic English language issues faced by the learners, while also aiming to foster in them, critical skills to develop a concise and clear argument, respond to others' comments and negotiate their own point of view persuasively. The course uses an interactive, participatory methodology, to engage learners' interest and boost their confidence to use English in everyday communication in formal and informal contexts.

Equivalent Course(s)

CSC 1102, BA 1105, SS 1116, BIO 1103, ME 1101, AF 1203, EN 1106, BST 1103

Course Name	Drawing and Perspective	**Credit Hours**	**3** (3,0)
Course Code	MD 1107	**Prerequisite(s)**	None

Course Description

This course introduces students to visual reading and thinking skills through the practice of elementary drawing techniques. The topics include linear and aerial perspective, composition, shape, space, volume, and proportion, depth and distance, horizons and vanishing-points, the use and manipulation of shadow and light, stippling and cross-hatching; primary, secondary, and complementary colors, rendering mood, expression, and motion.

Equivalent Course(s)

None

Course Name	Introduction to Media Industries	**Credit Hours**	**3** (3,0)
Course Code	MD 1115	**Prerequisite(s)**	None

Course Description

This course introduces students to the history, development, and impact of mass media nationally and internationally, with a focus on the different media outlets and industry/business models. It covers history of print and broadcast journalism, print, broadcast, and digital formats, fringe, mainstream, regional, national and international media structures, formats and business models. Also, functions and evolution of journalism, film, TV, print media, advertising, and digital technologies, and introduction to media convergence environment.

Equivalent Course(s)

MD 1117

Course Name	Civilization Studies-I	**Credit Hours**	**3** (3,0)
Course Code	MD 1116	**Prerequisite(s)**	None

Course Description

This course investigates major historical civilizations in Ancient Egypt, China, and India; classical Greece and Rome; and medieval and renaissance Europe. It also covers oral cultures and oral transmission, the invention of writing, the production and preservation of cultural and social artifacts and texts, the emergence, development, dissemination, and cross-cultural influences of aesthetic practices. Topics include comparative analysis of Asian, Greco-Roman, Chinese and Medieval traditions from Pyramids to Pre-Socratics and from Ancient Chinese thought to Early Cathedrals and from Bronze revolution in Central Asia to Iron revolution in India to the discovery of Laws of Reflection by Alhazen. The course places a fundamental emphasis on the history of ideas, cultural expressions, and social institutions. The course will stop at the discussions of the emergence of Gothic Cathedrals in France.

Equivalent Course(s) None

Course Name	Islamiat and Pakistan Studies/Humanities	**Credit Hours**	**3** (3,0)
Course Code	MD 2402	**Prerequisite(s)**	None

Course Description

The course focuses on the history, theory, and practice of Islam and other religions, and their social, political, and cultural importance and impact in Pakistan and beyond. It covers History of religion, religious practice and thought, major interpretive traditions, religion and society, religion and politics, mysticism and orthodoxy, Comparative religion, religion and gender, Islam and other Abrahamic religions, Islam and modernity.

Equivalent Course(s) SS 1109, CSC 1105, BA 1106, BIO 1212, EN 1105

Course Name	Photography	**Credit Hours**	**3** (3,0)
Course Code	MD1106	**Prerequisite(s)**	None

Course Description

This course introduces students to the history, science, and art of photography. It covers cameras, their construction and use, use of digital versus film as a medium, set-up, focus, framing, composition, indoor versus outdoor photography (studio versus landscape), lenses, apertures, lighting, film and shutter speed, exposure, and depth of field, panning, zooming, and light-painting, black-and-white versus color, basic Photoshop editing and manipulating, narrative photography, developing and printing, and portfolio presentation.

Equivalent Course(s) None

Course Name	English for Academic Purposes (EAP)	**Credit Hours**	**3** (3,0)
Course Code	MD 1222	**Prerequisite(s)**	MD 1122

Course Description

The course is designed to improve academic English language and study skills of students. The course follows a multidimensional approach based on the four language skills with a specific focus on reading and writing skills that are required in research-based study at university level. The course includes listening and note taking skills, library and internet use for locating and evaluating research articles. In addition, the course seeks to enable the students to of speed read, skim, scan and infer from written text. The course specifically focuses on enabling the students to experiment with complex grammatical forms, sentence structures and logical paragraph development, to present coherent, cohesive and effective arguments clearly in research-based writing according to the requirements of their specific discipline.

Equivalent Course(s) ME 1205, SS 2316, BIO 1211, BA 1206, CSC 2101, AF 1203, EN 1106

Course Name	Culture, Media and Society	**Credit Hours**	**3** (3,0)
Course Code	MD 1104	**Prerequisite(s)**	MD 1115, MD 1122

Course Description

This course covers the basic theoretical concepts and debates focused on the relations among media, cultural texts, and the communities within which these are produced and disseminated. The topics include Theories of media and popular culture – Marxism, structuralism, post-structuralism, modernity, and post-modernism. Subcultures and youth cultures. The role of media in culture and society, the politics of identity (race, gender, ethnicity, religion, sexuality, class, and nationality), the emergence and effect of cyber culture, globalization and multiculturalism.

Equivalent Course(s) SS 2312

Course Name	Art of Music	**Credit Hours**	**3** (3,0)
Course Code	MD 3601	**Prerequisite(s)**	None

Course Description

This course focuses upon the evolution and development of sound and music. It covers global and local genres and styles (western art music, Jazz, Indian classical, Qawwali, Hip-Hop, Rock, Punk, etc.), the history and evolution of instruments and instrumentation, electronic and digital music technologies, performance modes, forms, and venues, music's influence in the media and on popular culture, and music's relationship with the visual and performing arts.

Equivalent Course(s) None

Course Name	Basic Design	**Credit Hours**	**3** (3,0)
Course Code	MD 1211	**Prerequisite(s)**	MD 1107

Course Description

This course introduces students to fundamental elements and principles of design. It covers grids, hierarchies, scale, point, line, texture, color, value, proportion, space, and plane, figure-ground, color theory; form and composition, issues of balance, emphasis, position, unity, pattern, harmony, contrast, rhythm, repetition, and movement, and the anatomy of fonts and types.

Equivalent Course(s) None

Course Name	History and Aesthetics of Film	**Credit Hours**	**3** (3,0)
Course Code	MD 2321	**Prerequisite(s)**	None

Course Description

This course covers the history and aesthetics of world cinema from its origins to the present, emphasizing major directors, historically and critically important movements and films, the emergence and development of film genres, and the aesthetic effects of technological innovations. The topics include Origins (Edison, Melies and Griffith), German Expressionism (Wieneand Lang), Soviet montage (Eisenstein), American and Indian Silent Films (Chaplin, Keaton, and Wadia Movietone), Impressionism and Surrealism (Bunuel and Renoir), national cinemas (Italy, Japan, France, Eastern Europe, and India), American Melodrama (Sirk and Minnelli), film genres, the studio system, auteur directors, technological developments and apparatus theory, and experimental film.

Equivalent Course(s) None

Course Name	Introduction to Sound	**Credit Hours**	**3** (3,0)
Course Code	MD 1217	**Prerequisite(s)**	None

Course Description

This course introduces students to; the properties and uses of sound in media texts, evolving technologies, and techniques employed to create sound recordings. It covers basic sound recording and editing (looping, sampling, sequencing, mixing, and mastering), introduction to Presonus Studio 1, volume envelopes, voice-over editing, dynamics processing, sound design, and film scoring.

Equivalent Course(s) None

Course Name	Design Practices-I	**Credit Hours**	**3** (3,0)
Course Code	MD 2427	**Prerequisite(s)**	MD 1211

Course Description

This course covers the theory and practice of design to inculcate logical methods of reasoning through design problems, and to polish aesthetic sensibilities. The course introduces students to all the important software such as InDesign, Illustrator, Photoshop, CorelDraw, Freehand, etc. Topics may include package design, basic typography (Urdu and English), signs, symbols, logos and identities, illustration, photography, 2-D versus 3-D design, visual problem-solving, symmetry and asymmetry, rhythm and balance, hierarchies, layers, transparencies, and visual thinking.

Equivalent Course(s) MD 1208

Course Name	Topics in Asian Literature	**Credit Hours**	**3** (3,0)
Course Code	MD 1118	**Prerequisite(s)**	MD 1222

Course Description

This course introduces students to a range of literatures produced in Asia—fiction, poetry, and drama. It covers a range of themes and styles employed by Asian writers, examines how these writers appropriated and renewed older narrative forms and conventions, and consider how and why this body of work both responds to/and reconstructs Asian constructs of nation, society, community, and identity.

Equivalent Course(s) SS 2404

Course Name	Production Practices-I	**Credit Hours**	**3** (3,0)
Course Code	MD 2323	**Prerequisite(s)**	MD 1107, MD 1217

Course Description

This course introduces students to the basic craft of film and video production. Students will practice how to conceive, shoot, edit, and show a silent, low-budget, and simple narrative film. The topics include the technology of motion pictures, HD cameras, flip-books, stop-motion animation, frames, storyboarding, basic camera set-ups, basic lighting, framing, focus and lenses, panning, basic editing, creating rough-cuts, the role of the DP, production processes, and film screenings.

Equivalent Course(s) MD 2311

Course Name	Civilization Studies-II	**Credit Hours**	**3** (3,0)
Course Code	MD 1216	**Prerequisite(s)**	MD 1116

Course Description

This course will start from the emergence of Gothic Cathedral and will offer an introduction to the aesthetic and contextual study of different movements from renaissance to the present. The course will investigate how one art movement triggered the other and how to discover connections among the art movements of different times. The course also discusses societies, cultures, and art of major Islamic civilizations through history.

Equivalent Course(s) None

Course Name	Idea Development	**Credit Hours**	**3** (3,0)
Course Code	MD 2313	**Prerequisite(s)**	MD 1107, MD 1211

Course Description

This course introduces students to strategies that will help them generate narrative ideas applicable to advertising, journalism, and film and video production. It covers theories and structures of narrative, elements of storytelling, the psychology of narrative, effective brainstorming, visual versus print narratives, finding images, idioms, analogies, and metaphors, parables and allegories, causality, probability, and necessity, simple and complex plots, inventing and developing characters, establishing place, conceiving, and shaping stories visually.

Equivalent Course(s) None

Course Name	Principles of Journalism	**Credit Hours**	**3** (3,0)
Course Code	MD 3505	**Prerequisite(s)**	MD 1222

Course Description

This course introduces students to basic news, feature, and editorial writing, and reporting. It covers lead writing, story-structure, interviewing, note-taking, background research, issue analysis, feature development, editorials, editing, journalistic ethics, print versus digital, and evidence and inference.

Equivalent Course(s) None

Course Name	Play Analysis	**Credit Hours**	**3** (3,0)
Course Code	MD 1119	**Prerequisite(s)**	MD 1222

Course Description

The focus of this course is upon a variety of techniques and strategies through which theatrical texts are analyzed and understood. It discusses plot and scene structures, character construction, the use and effect of language, syntax, rhythm, tone, sound, gesture, movement, design, and spatial composition, the origins and development of performance conventions, the relationship between audiences and performances, the interplay between performed events, and cultural and social formations.

Equivalent Course(s) None

Course Name	History of Commercial Art	**Credit Hours**	**3** (3,0)
Course Code	MD 2318	**Prerequisite(s)**	MD 2427

Course Description

This course introduces students to the history of commercial art from lithography to logos, book design to branding, stencils to motion graphics, and covering the origins and history of advertising and design. The topics include defining commercial art, origins and history of commercial art and design, inventing alphabets, illuminated manuscripts, the psychology of branding, graphic design versus advertising design, impact of new technologies from the printing press to computers, and the past, present, and the future of commercial design.

Equivalent Course(s) None

Course Name	Audiovisual Editing	**Credit Hours**	**3** (3,0)
Course Code	MD 2425	**Prerequisite(s)**	MD 2323

Course Description

This course discusses the aesthetics and techniques of sound and video editing. The topics include perspective, transitions, and pace, cutting, splicing, fading, dissolving, and wiping, controlling and manipulating content and audience response, continuity editing, frame rates and temporal compression, visual effects, axis of action, jump-cuts, eye-lines and match-cuts, incorporating sound, ambient and Foley sound effects, and musical scoring.

Equivalent Course(s) None

Course Name	Radio Programming and Production	**Credit Hours**	**3** (3,0)
Course Code	MD 3525	**Prerequisite(s)**	MD 1217, MD 3601

Course Description

This course aims to train students to apply in a practical setting the skills they've learned in their sound and music classes using ***SZABIST***'s on-campus radio station. It discusses digital audio recording, digital workstations, and introduction to Studio 1, editing techniques, and radio story production and programming.

Equivalent Course(s) MD 3511

Course Name	Design Practices-II	**Credit Hours**	**3** (3,0)
Course Code	MD 3527	**Prerequisite(s)**	MD 2427

Course Description

This course extends and develops theories and practices introduced in Graphic Design-I. It discusses contemporary trends and styles, advanced layout strategies, merging text and art, sustainable design, propaganda design, the psychological impact of design, advanced typography (Urdu and English), publication design, brochures, packaging, posters, cover art, advanced Photoshop techniques, and advanced Illustrator techniques.

Equivalent Course(s) MD 2409

Course Name	Media Research	**Credit Hours**	**3** (3,0)
Course Code	MD 2325	**Prerequisite(s)**	MD 1104, MD 1222

Course Description

This course teaches the quantitative and qualitative methods for media research. It covers designing research question, reviewing the literature, writing proposal, researching industry, researching text, researching audiences, research tools – questionnaire, focus group interviews, ethnography, phenomenology, hermeneutics, etc.

Equivalent Course(s) MD 4845, BA 3508, MD 2416

Course Name	Theater Project	**Credit Hours**	**3** (3,0)
Course Code	MD 2423	**Prerequisite(s)**	MD 1119

Course Description

This course discusses the techniques of theater and documentary production using a form developed in the US through the auspices of the Federal Theatre Project, and to create an original Living Newspaper performance. It covers history and practice of documentary theater and performance, the Living Newspaper and the Federal Theater Project, selecting and researching newsworthy topics, conducting archival research, conducting field interviews, improvisation and script development, staging and design, and rehearsals and performance.

Equivalent Course(s) None

Course Name	Media Psychology	**Credit Hours**	**3** (3,0)
Course Code	MD 2424	**Prerequisite(s)**	MD 2325

Course Description

This course introduces students to the basic principles of human behavior, with a focus on how different media shape and affect who we are and how we think. It covers formation of personality types, the structures of learning, the development and manifestation of phobias and neuroses, the functions of memory, perception, emotion, and the effect of media images on self-perception.

Equivalent Course(s) SS 2306

Course Name	Production Practices-II	**Credit Hours**	**3** (3,0)
Course Code	MD 3523	**Prerequisite(s)**	MD 1217, MD 2313 MD 2323

Course Description

This course develops and extends the theories and techniques introduced in Production Practices-I. Production Practices II introduces students to use elements of sound and dialogue with visuals in narrative films. It covers advanced single-camera techniques, using camera angles, jibs, cranes, tracks, and dolleys; manipulating color and light, lenses and looks, digital speed, color temperatures, filters, and gels, visual storytelling, 3-act structures, production design, advanced sound editing, advanced digital editing, and linear and non-linear pre and post production strategies.

Equivalent Course(s) None

Course Name	Media Laws and Ethics	**Credit Hours**	**3** (3,0)
Course Code	MD 2405	**Prerequisite(s)**	MD 1115, MD 1222

Course Description

This course introduces students to the way media policies are influenced and shaped by legal and ethical considerations. It covers basic ethical theories, defining media laws, free speech and human rights, press freedoms and democratic politics, slander, defamation and libel, morality, propriety and obscenity laws, private and public knowledge, objectivity and sensationalism, conflicts of interest and transparency, the use, abuse, and protection of sources, accuracy, liability and licensing, regulating advertising, copyright laws and fair-use, self-censorship and content regulation, federal, provincial, and local laws, Pakistan Electronic Media Regulatory Authority (PEMRA), new media technologies and the law, and contempt of court.

Equivalent Course(s) None

Course Name	Creative Writing	**Credit Hours**	**3** (3,0)
Course Code	MD 1213	**Prerequisite(s)**	MD 1222, MD 2313

Course Description

This course introduces students to various forms and techniques of creative writing in both English and Urdu. The topics include understanding and analyzing creative texts, writing prose fiction and non-fiction, understanding and writing poetry, and creative expression in different genres and language styles.

Equivalent Course(s) None

Course Name	Animation and Motion Graphics	**Credit Hours**	**3** (3,0)
Course Code	MD 3518	**Prerequisite(s)**	MD 2425, MD 2427

Course Description

This course discusses the principles of motion graphic design, and to teach them how to create complex, multi-layered animations. It also covers after effects (AE) basics; interface and palettes, vector art versus bitmap art, anchor points, typography in AE, track mattes, layers, framing, basic animation, and rotoscoping, motion masks, composing and nesting, using green screens, color keying and compositing, expressions in AE; scripting, time remapping, and temporal processing.

Equivalent Course(s) None

Course Name	State and Nation Building in Pakistan	**Credit Hours**	**3** (3,0)
Course Code	MD 4701	**Prerequisite(s)**	MD 1216, MD 1222, MD 2325

Course Description

The focus of this course is on both the idea and fact of Pakistan starting with the 1857 War of Independence, extending through Partition, the founding of the nation and its subsequent dismemberment, and ending with contemporary issues and challenges facing our future. The topics include theories of nationalism, Iqbal and Pakistan, partition and political relations with India, military versus civilian rule 1971 war and the break-up of Pakistan, 1973 Constitution, secularism and Islam, national symbols and national identity, the role of the media, foreign policy, and national identity.

Equivalent Course(s) SS 3605

Course Name	Theories of Visual Culture	**Credit Hours**	**3** (3,0)
Course Code	MD 3506	**Prerequisite(s)**	MD 1104, MD 1222, MD 2325

Course Description

This course introduces students to a range of theoretical approaches to defining, analyzing, and categorizing visual texts including, but not limited to, films, photographs, advertisements, television shows, sculpture, graffiti, architecture, paintings, performance, fashion, graphic and interior design. It covers theory versus praxis, defining the visual, the sociological processes of culture, the politics of visual culture, conspicuous consumption, Marxist, feminist, structuralism, and semiological approaches to visual culture, substance versus style, and McLuhan, media, and messages.

Equivalent Course(s) SS 4804

Course Name	Thesis-I	**Credit Hours**	**3** (3,0)
Course Code	MD 4807	**Prerequisite(s)**	MD 2325, MD 3506 MD 3523, MD 3527, MD 3505, MD 1213, MD 2424. Thesis will beoffered after completion of six semesters.

Course Description

It is a two-semester project that allows advertising, journalism, and film students the opportunity to demonstrate to the Media Sciences faculty their proficiency in their chosen area of specialization. It covers proposal development and pre-production (Communication design and market research, component gathering, scriptwriting, campaign planning, storyboarding, production design, and story research).

Equivalent Course(s) None

Course Name	Producing Short Narratives	**Credit Hours**	**3** (3,0)
Course Code	MD 4714	**Prerequisite(s)**	MD 3523

Course Description	This course focuses on how to conceive, write, storyboard, film, edit, produce, and present a short project employing the skills they have learned in their production and design courses in the previous five semesters. It discusses conceiving and scripting, creating characters, design and art direction, light and shot referencing, creating storyboards and mood boards, music and sound selection and design, short narratives across cultures, music videos, and PSAs.
Equivalent Course(s)	MD 3603

Course Name	Thesis-II	**Credit Hours**	**3** (3,0)
Course Code	MD 4808	**Prerequisite(s)**	MD 4807

Course Description	The course is a culmination of thesis I. Students start their projects (films, documentaries, journalistic assignments, written work, advertising or design projects) and makes final presentations to demonstrate their proficiency in their chosen area of specialization.
Equivalent Course(s)	None

4.2.1 Master of Advertising (MoA)

Master of Advertising (30 credit hours)

The Faculty of Media Sciences at SZABIST offers an evening, 18 months Master's degree program in Advertising, providing students, a comprehensive training through courses that prepare them to engage in various career options in the advertising industry. To be awarded a Master of Advertising degree, students need to complete total of 30 credit hours (10 courses), which include:

- *5 core courses (15 credit hours)*
- *3 electives[32] (9 credit hours)*
- *Research Project I & II (6-credit hours)*

Within four (4) years.

Course Code	Course Title	
First Year		
Fall Semester		
MD 5168	Research Methods in Advertising	198
MD 5164	History of Communication and Advertising	198
MD 5166	Ideation Techniques in Advertising	198
MD 5167	Principles of Advertising	199
Spring Semester		
MD 5268	Creative Advertising Campaigns	199
MD 5169	Research Project-I	199
MD 5xxx	Elective-I	-
MD 5xxx	Elective-II	-
Second Year		
Fall Semester		
MD 5269	Research Project-II	200
MD 5xxx	Elective-III	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

32- List of Electives is given in Appendix B.

4.1.1 Master of Advertising (MoA)

Compulsory Courses

Course Name	Research Methods in Advertising	**Credit Hours**	**3** (3,0)
Course Code	MD 5168	**Prerequisite(s)**	None

Course Description

This course teaches students how to conduct research that helps them understand how consumer behavior and advertisements work, and that maximizes the effective reach of advertising campaigns. It covers advanced quantitative vs. qualitative research strategies, collecting and interpreting data sets, customized vs. syndicated research, effective pre and post testing studies, flows of attention, emotion, and meaning, brand linkage and branding moments, ad tracking, longitudinal vs. latitudinal studies, selective perception, picture, and copy sorts.

Equivalent Course(s) MD 5162 SS 3504 BA 5609

Course Name	History of Communication and Advertising	**Credit Hours**	**3** (3,0)
Course Code	MD 5164	**Prerequisite(s)**	None

Course Description

This course introduces students to a sociological analysis of advertising and its' role in society. It covers the historical beginnings of contemporary advertising and its relationship to popular culture. Part of Visual and Oral Communication theories, advertising content, mechanisms of persuasion and effects on human behavior is studied through representation of gender, class, race and ethnicity present in various groups; inclusive of how advertising and social constructs affects children and society.

Equivalent Course(s) None

Course Name	Ideation Techniques in Advertising	**Credit Hours**	**3** (3,0)
Course Code	MD 5166	**Prerequisite(s)**	None

Course Description

This course introduces students to the ideation process and its strategic use in creative development in applied Advertising. From generating original and inspiring ideas to developing cohesive narratives and integrating them into effective advertising campaigns, this is an applied course with advertising industry application. The course introduces students to the history of ideas to current mind mapping techniques and gives examples from theoretical models used in stages of the Idea development process, in context of Advertising.

Equivalent Course(s) None

4.11 Master of Advertising (MoA)

Course Name	Principles of Advertising	**Credit Hours**	**3** (3,0)
Course Code	MD 5167	**Prerequisite(s)**	None

Course Description

The purpose of this course is to give an overview of the advertising industry, its functions and practices, and an appreciation of its place within the broader communications context.

In the course the students will analyze and discuss examples of advertising, discovering best practice in the advertising industry, and exploring the processes involved in creating campaigns.

They will examine advertising practice and processes: advertising agencies, advertising professional roles, advertising clients, target audiences, media, and strategic and creative thinking. A historical analysis sheds light on the important role social forces have played in the evolution of advertising.

Equivalent Course(s) None

Course Name	Creative Advertising Campaigns	**Credit Hours**	**3** (3,0)
Course Code	MD 5268	**Prerequisite(s)**	None

Course Description

This course investigates issues associated with creativity in advertising such as development of creative strategy, generation of successful advertising messages and evaluation of creative output to produce campaigns. By the end of this course you will have worked collaboratively in a team to design and create a live advertising campaign.

The course includes a work integrated learning experience in which your knowledge and skills will be applied and assessed in a real or simulated workplace context and where feedback from industry and/or community is integral to your experience.

Examine creative approaches to advertising within global markets.

Equivalent Course(s) None

Course Name	Research Project-I	**Credit Hours**	**3** (3,0)
Course Code	MD 5169	**Prerequisite(s)**	Dept. Permission

Course Description

Research Project I provides students with an opportunity to conduct a sustained research and analysis focused on a subject of their choice. During the course of the project, the students: Select their brand/product/service (subject); Conduct an extensive market research; Comprehensively analyse the various aspects that affect the subject; Develop a comprehensive Advertising Strategy for their subject; Outline a detailed campaign strategy for the subject.

Equivalent Course(s) None

Course Name	Research Project-II	**Credit Hours**	**3** (3,0)
Course Code	MD 5269	**Prerequisite(s)**	MD 5169

Course Description

Research Project II is application of Research Project I. Students provide a market analysis, creative advertising strategy focused on the advertising problem and all necessary creatives. Students present their final advertising strategy to an external jury of advertising experts.

Equivalent Course(s)

None

4.2.2 Master of Science in Media Studies (MS Media Studies)

Students enrolled in MS in Media Studies program are required to complete 30 credits within four (4) years. The breakup of the courses is as follows:

- *6 Compulsory Courses (18 Credit Hours)*
- *2 Elective[33] (6 Credit Hours)*
- *2 Independent Research Studies/2 Thesis/2 Electives (6 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
MD 5104	Research Methodology	202
MD 5102	Media and Contemporary Culture	202
MD 5113	Management Concepts in Media Industries	202
	Spring Semester	
MD 5207	Media Evolution and Innovation	203
MD 5201	Communication for Social Change	203
MD 5213	Social and Cultural Impact of GEC Programming(for GEC Stream)	203
MD 5215	Production Design (for Production Stream)	204
MD 5214	Journalism Law and Ethics (for Journalism Stream)	204
	Second Year	
	Fall Semester	
MD 5xxx	Elective-I	-
MD 5xxx	Elective-II	-
MD 5xxx	Independent Research Study-I /Thesis I / Course Work (Elective from selected stream)	-
	Spring Semester	
MD 5xxx	Independent Research Study-II /Thesis II / Course Work (Elective from selected stream)	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

33- List of Electives is provided in Appendix B

4.1.1 Master of Science in Media Studies (MS Media Studies)

Compulsory Courses

Course Name	Research Methodology	**Credit Hours**	**3** (3,0)
Course Code	MD 5104	**Prerequisite(s)**	None

Course Description

This course introduces students to both qualitative and quantitative methods of research and analysis. The topics include: designing research (choosing, narrowing, and shaping topics); articulating research questions and hypotheses; conducting literature reviews; quantitative methods (sampling, designing questionnaires, conducting interviews, selecting focus groups, analyzing data); qualitative methods (primary vs. secondary sources, adjudicating contradictory information, assessing bias); textual analysis; historical analysis; productions analysis; audience analysis, and writing research reports.

Equivalent Courses

SS 5229, SS 6313, MS 5131

Course Name	Media and Contemporary Culture	**Credit Hours**	**3** (3,0)
Course Code	MD 5102	**Prerequisite(s)**	None

Course Description

This course discusses theoretical foundations of contemporary cultural criticism, especially as this relates to aesthetic, social and political practices across media. The topics include: Theories of media and popular culture-Marxism, structuralism, post-structuralism, modernity, and post-modernism. Also, subcultures and youth cultures, the role of media in culture and society, the politics of identity (race, gender, ethnicity, religion, sexuality, class, and nationality), the emergence and effect of cyber culture, globalization and multiculturalism.

Equivalent Course

None

Course Name	Management Concepts in Media Industries	**Credit Hours**	**3** (3,0)
Course Code	MD 5113	**Prerequisite(s)**	None

Course Description

This course instills a sound grounding of management theories and practices. To build a bridge between management theories and their relevance to media organizations. To keep the students abreast of the best management practices in the field and how to implement them in their professional careers.

Equivalent Course(s)

MS 5112, MS 5238, BA 5601

4.1.1 Master of Science in Media Studies (MS Media Studies)

Course Name	Media Evolution and Innovation	**Credit Hours**	**3** (3,0)
Course Code	MD 5207	**Prerequisite(s)**	None

Course Description

This course aims at discussing the emergence, growth, and development of media practices and technologies, and to chart future possibilities. The topics include Birth of media technologies; traditional media content; economic, social and cultural influences; traditional content and technologies; emergence, evolution, and institutionalization of telecommunications technologies; synergy and integration; and ethical implications of developing technologies and future directions.

Equivalent Courses

MD 5164

Course Name	Communication for Social Change	**Credit Hours**	**3** (3,0)
Course Code	MD 5201	**Prerequisite(s)**	None

Course Description

This course teaches students how to develop, apply, and coordinate communication strategies that help facilitate interdisciplinary collaboration and social change. The topics include: Models of communication, information ecosystems, change theories, the impact of media concentration and interactions in the Triple Helix model i.e. Public, Private and Academia, conflict management and resolution, media activism, gender and its role in social change, and content diversity and its socio-economic and political impact.

Equivalent Courses

None

Course Name	Social and Cultural impact of GEC Programming	**Credit Hours**	**3** (3,0)
Course Code	MD 5213	**Prerequisite(s)**	None

Course Description

MD5213 Social and Cultural Impact of GEC Programming is a specialized course of the MSMD Programme. It looks at how the shift of communication theories until the 20th century have affected the 21st-century communications. It explores challenges in the modes of communication and, how these have affected the channels and the entertainment industry in general.

Students get to understand communication forms and strategies in the 21st century Digital Age.

Equivalent Course(s)

None

4.1.1 Master of Science in Media Studies (MS Media Studies)

Course Name	Production Design	**Credit Hours**	**3** (3,0)
Course Code	MD 5215	**Prerequisite(s)**	None

Course Description

This course provides a comprehensive overview of production design, for print, theatre and screen. It covers fundamentals of the field, carefully building on to more abstract aesthetics followed by specifics of realization of design and implementation details.

It provides an understanding of the role of a production designer and gain insight into the local industry.

Students learn the skills of concept development, Design research, development and communication, an understanding of the dynamics of dialogue and camera concerning the given surrounding (working with the storyboard and client brief), other skills of Layouts and floor plans, use of materials, light, textures and colour both in set and costume design, budgeting.

Equivalent Course(s) None

	Journalism Law and Ethics	**Credit Hours**	**3** (3,0)
	MD 5214	**Prerequisite(s)**	None

Course Description

This course examines key legal and ethical issues facing journalists and journalism. The accent is on evolution and character.

This course would help scholars to have an understanding of the field of journalism in a democratic society and its relevance to Pakistan.

The scholars would be able to identify and understand various pressing issues, rights and responsibilities for journalists and journalism in Pakistan. They will be able to reflect critically on various ethical considerations.

Equivalent Course(s) None

Department of Biosciences

6.1 Bachelor of Science

6.1.1 Bachelor of Science in Biosciences (BS-Biosciences)

Students enrolled in Bachelor of Science in Biosciences (BS Bio) program are required to complete 43 courses and a research report with a minimum of 135 credit hours, within seven (7) years to become eligible for obtaining the BS degree in Biosciences. The break-up of 43 courses is as follows:

- *39 Compulsory Courses (117 credit hours)*
- *4 Electives[34] (12 credit hours)*
- *1 Research Report (6 credit hours)*

34- List of Electives is given in Appendix B.

6.1. Bachelor of Science in Biosciences (BS-Biosciences)

Course Code	Course Title	Page #
	Third Year	
	Fall Semester	
BIO 2406	Genetic Engineering	216
BIO 3507	Biotechnology-I	216
BIO 2405	Hematology	217
BIO 4801	Bioethics	217
BIO 3505	Pharmacology-I	217
BIO 2306	Psychology	218
	Spring Semester	
BIO 2407	Basic Endocrinology	218
BIO 3607	Biotechnology-II	218
BIO 3601	Agricultural Science	219
BIO 2304	Nutrition and Dietetics	219
BIO 3605	Pharmacology-II	219
BIO 4703	Research Methodology	220
	Fourth Year	
	Fall Semester	
BIO 4701	Business Management	220
BIO 4705	Research Report-I	220
BIO 2309	Animal and Plant Tissue Culture	221
BIO 2402	Bioinformatics	221
BIO 4xxx	Elective-I	-
BIO 4xxx	Elective-II	-
	Spring Semester	
BIO 2403	Environmental Sciences	221
BIO 4802	Biophysics	222
BIO 3509	Epidemiology	222
BIO 4805	Research Report-II	220
BIO 4xxx	Elective-III	-
BIO 4xxx	Elective-IV	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

6.1.1 Bachelor of Science in Biosciences (BS-Biosciences)

Compulsory Courses

Course Name	Cell Biology	**Credit Hours**	**3** (2,1)
Course Code	BIO 1101	**Prerequisite(s)**	None

Course Description

The course topics include: cell theory, structure, chemical constituents of cell and cell organelles and their functions, separation of cell organelles, cell membrane, its molecular organization and functional role. The concept of the unit membrane, the fluid mosaic model, membrane receptors and transport mechanisms, endoplasmic reticulum, lysosome, micro-bodies, mitochondrial ultra-structure and function, chloroplast ultra-structure and the mechanism of photosynthesis. Cell movements, structure and function of cytoskeleton, centriole, cilia and flagella, the mitotic apparatus. The nucleus, structure and function of chromosomes, and the cell cycle. Fundamentals of Eukaryotic Gene Expression, and reproduction in Eukaryotic cell.

Equivalent Course(s)

None

Course Name	English for General Purposes	**Credit Hours**	**3** (3,0)
Course Code	BIO 1111	**Prerequisite(s)**	None

Course Description

The course is aimed at improving English language communication and presentation skills of students. With a multidimensional approach, the course enables the students to practice the use of English in everyday situations, building upon all four skills: listening, speaking, reading and writing. It prepares them to participate in seminars and discussions and make effective presentations, with an awareness of the audience and effective use of verbal and non-verbal communication. The course addresses the basic English language issues faced by the learners, while also aiming to foster in them, critical skills to develop a concise and clear argument, respond to others' comments and negotiate their own point of view persuasively. The course uses an interactive, participatory methodology, to engage learners' interest and boost their confidence to use English in everyday communication in formal and informal contexts.

Equivalent Course(s)

CSC 1102, BA 1105, SS 1116, MD-1122, BIO 1103, ME 1101, AF 1203, EN 1106, BST 1103

6.1. Bachelor of Science in Biosciences (BS-Biosciences)

Course Name	Fundamental Mathematics	**Credit Hours**	**3** (3,0)
Course Code	BIO 1107	**Prerequisite(s)**	None

Course Description

The course topics include:

Preliminaries: Real-number system, complex numbers, introduction to sets, set operations, functions, types of functions.

Matrices: Introduction to matrices, types, matrix inverse, determinants, system of linear equations, Cramer's rule.

Quadratic Equations: Solution of quadratic equations, qualitative analysis of roots of a quadratic equations, equations reducible to quadratic equations, cube roots of unity, relation between roots and coefficients of quadratic equations.

Sequences and Series: Arithmetic progression, geometric progression, harmonic progression.

Binomial Theorem: Introduction to mathematical induction, binomial theorem with rational and irrational indices.

Trigonometry: Fundamentals of trigonometry and trigonometric identities.

Equivalent Course(s) BA 1204, AF 1102, EN 1101

Course Name	Lab Management	**Credit Hours**	**3** (2,1)
Course Code	BIO 2404	**Prerequisite(s)**	BIO 1209

Course Description

The course topics include; Introduction to lab management, quality management systems, health safety in laboratories, work safety legislations, animal biosafety consideration, fire safety and risk assessment, hazards of biological waste and disposal, basic principles of biosafety, levels of biosafety, biocontainment of genetically modified organisms, packing and shipment of biological materials.

Equivalent Course(s) None

6.1. Bachelor of Science in Biosciences (BS-Biosciences)

Course Name	Chemistry	**Credit Hours**	**3** (2,1)
Course Code	BIO 1109	**Prerequisite(s)**	None

Course Description

The course topics include: Chemical Bonding: types of chemical bonding, localized bond approach, theories of chemical bonding. Acids and Bases. Brief concepts of chemical equilibrium. p-Block Elements, Basic concepts of organic chemistry: structure- aromaticity, inductive effect, dipole moment, resonance and its rules, hyperconjugation, classification and nomenclature of organic compounds including IUPAC system, types of organic reactions (an overview). Chemistry of Hydrocarbons: saturated, unsaturated and aromatic hydrocarbons with emphasis on synthesis and free radical, electrophilic addition and electrophilic substitution reactions. Chemistry of Functional Groups: Green Chemistry, ionic liquids, super critical extraction technology, Chemical Thermodynamics, Chemical Equilibrium, Solution Chemistry, Physical properties of liquids, surface tension, viscosity, refractive index. Chemical Kinetics, The rates of reactions, zero, first, second and third order reactions with same and different initial concentrations, half-lives of reactions. Classical Analytical Methods in Chemical Industries.

Equivalent Course(s) None

Course Name	Microbiology-I	**Credit Hours**	**3** (2,1)
Course Code	BIO 1113	**Prerequisite(s)**	None

Course Description

The course topics include; Fundamentals of Microbiology, Microorganisms and their respective place in the living world, differentiation between prokaryotic and eukaryotic cells, historical development of Microbiology and its scope. Microscopy, morphology, bacterial taxonomy and nomenclature, other topics include growth, nutrition (physical and nutritional requirement and nutritional types, sources of energy, C, N, H, O, S, P, H2O, trace elements, growth factors) and reproduction, general methods of studying microorganisms, including cultivation, isolation, purification and characterization, control of microorganisms by physical and chemical methods. Chemotherapeutic agents and antibiotics, modes of action of antibiotics on microorganisms, basic properties of fungi, protozoa and algae, and a brief introduction to structure and propagation of viruses and bacteriophages.

Equivalent Course(s) None

6.1. Bachelor of Science in Biosciences (BS-Biosciences)

Course Name	Biochemistry-I	**Credit Hours**	**3** (2,1)
Course Code	BIO 2301	**Prerequisite(s)**	None
Course Description	The course topics include; Water, pH, buffers, diffusion, osmosis, surface tension, carbohydrates, amino acids, proteins, structure and function, molecular structure of proteins, relationship between the structure and function of proteins, relationship of primary structure and function of protein, enzymes, the Michaelis-Menten equation, enzyme inhibitors, reversible enzyme inhibition, irreversible enzyme inhibition. Lipids, vitamins and nucleic acids.		
Equivalent Course(s)	None		

Course Name	English for Academic Purposes	**Credit Hours**	**3** (3,0)
Course Code	BIO 1211	**Prerequisite(s)**	BIO 1111
Course Description	The course is designed to improve academic English language and study skills of students. The course follows a multidimensional approach based on the four language skills with a specific focus on reading and writing skills that are required in research-based study at university level. The course includes listening and note taking skills, library and internet use for locating and evaluating research articles. In addition, the course seeks to enable the students to of speed read, skim, scan and infer from written text. The course specifically focuses on enabling the students to experiment with complex grammatical forms, sentence structures and logical paragraph development, to present coherent, cohesive and effective arguments clearly in research-based writing according to the requirements of their specific discipline.		
Equivalent Course(s)	BA 1206, CSC 2101, BIO 1202, ME 1205, MD 1222, SS 2316, AF 1203, EN 1106		

Course Name	Sociology	**Credit Hours**	**3** (3,0)
Course Code	BIO 1214	**Prerequisite(s)**	None
Course Description	The course focuses on three central themes: social change, social inequality, and social harmony versus conflict. It combines selective theoretical texts with case studies to understand the mechanisms and institutions that can trigger, foster, sustain, or undermine each of the three processes. The course covers the work of major sociological thinkers and the influence of sociology on modernization, race, citizenship, culture, gender, society, and economic development.		
Equivalent Course(s)	BA 2307, BA 2306, MD 1104, AF 2304, SS 2307		

6.1. Bachelor of Science in Biosciences (BS-Biosciences)

Course Name	Statistics	**Credit Hours**	**3** (3,0)
Course Code	BIO 1208	**Prerequisite(s)**	BIO 1107

Course Description

The course topics include; Definition of statistics, characteristics, importance and limitations, population and samples, frequency distribution and probabilities, formation of frequency table from raw data, histograms, applications of probabilities to simple events, measures of central tendencies and dispersion, arithmetic mean, median, mode, range, variance and standard deviation, standard error of the mean, mean deviation, semi interquartile range, standard distribution (binomial, poison and normal distributions, properties and application, normality), test of significance (t-test, X^2-test, F-test, L.S.D. test, multiple range test), design of experiment, brief account of correlation and regression, and computer based statistical software applications.

Equivalent Course(s)

CSC 2105, BA 3605, BA 5405, BA 5305, BA 2305, BIO 1208, AF 2406, EN 2304, BST 1206

Course Name	Islamic Studies/Ethics and Pakistan Studies	**Credit Hours**	**3** (3,0)
Course Code	BIO 1212	**Prerequisite(s)**	None

Course Description

Islamiat: Islamic history, Introduction to Quranic studies, study of selected text of Holy Quran, Seerat of Holy Prophet (S.A.W), Introduction to Sunnah, Selected study of Hadith, Islamic culture & civilization, Islam & Science, Eonomic, Political, and Social System of Islam.

Ethics: This course introduces contemporary and controversial ethical issues facing the scientific community. Topics include moral reasoning, moral dilemmas, law and morality, equity, justice and fairness, ethical standards, and moral development. Upon completion, students should be able to demonstrate an understanding of their moral responsibilities and obligations as members of the workforce and society.

Pakistan Studies: Historical Perspective: Ideological rationale with special reference to Sir Syed Ahmed Khan, Allama Muhammad Iqbal and Quaid-i-Azam Muhammad Ali Jinnah, Factors leading to Muslim separatism. Government and Politics in Pakistan: Political and constitutional phases of 1947-58, 1958-71, 1971-77, 1977-88, 1988-99, 1999 onward. Contemporary Pakistan: Economic institutions and issues, Society and social structure, Ethnicity, Foreign policy of Pakistan and challenges, Futuristic outlook of Pakistan.

Equivalent Course(s)

BA 1106, CSC 1105, MD 2402, SS 1109, CSC 1105, EN 1105

6.1. Bachelor of Science in Biosciences (BS-Biosciences)

Course Name	Physiology-I	**Credit Hours**	**3** (2,1)
Course Code	BIO 1206	**Prerequisite(s)**	None

Course Description

This course is designed to provide students with an understanding of the function and regulation of the human body and physiological integration of the organ system. The course topics include; basic principle of physiology level of chemical and physiological organization of human, cell physiology, physiology blood and blood cells cardiovascular and circulatory system. Physiology of respiratory system, mechanism of oxygen transport into the cells and physiology of renal system.

Equivalent Course(s) None

Course Name	English for Professional Purposes	**Credit Hours**	**3** (3,0)
Course Code	BIO 2411	**Prerequisite(s)**	BIO 1111, BIO 1211

Course Description

This technical and business writing course focuses on the use of English in professional contexts. The course aims to develop interpersonal communication skills in a dynamic, digitalized and globally connected business world. This interactive course will create an awareness in the students about the basics of communication in formal contexts, allows them to analyze the mechanics of technical business writing with the use of specific registers, and experiment with different types of letters, memos, reports, proposals, presentations, and manuals to communicate complex information with clarity, conciseness, and force to meet the basic business communication needs of working professionals.

Equivalent Course(s) CSC 1205

Course Name	Biochemistry-II	**Credit Hours**	**3** (2,1)
Course Code	BIO 2401	**Prerequisite(s)**	BIO 2301, BIO 1206

Course Description

The course topics include, metabolism, metabolic pathways, major pathways in cells, thermodynamics and metabolism. The concept of oxidation electron transport chain and oxidative phosphorylation. Carbohydrate metabolism, lipids metabolism, amino acid metabolism, nucleotide metabolism, introduction to molecular biology, and introduction to endocrinology.

Equivalent Course(s) None

6.1. Bachelor of Science in Biosciences (BS-Biosciences)

Course Name	Introduction to Computing	**Credit Hours**	**3** (2,1)
Course Code	BIO 1104	**Prerequisite(s)**	None

Course Description

The course topics include; basic computing hardware (input, output, processing and storage devices) and software classification with important historical events; software applications using office automation tools (Word Processor, Spread Sheet, Presentation Software); effective use of internet/intranet; introduction to software/web programming and development, computer networks, information technology within the broader domain of computing, and social issues of computing.

Equivalent Course(s)

CSC 1104, BA 1108, BA 1103, AF 1102, EN 1102, BST 1102

Course Name	Microbiology-II	**Credit Hours**	**3** (2,1)
Course Code	BIO 1213	**Prerequisite(s)**	BIO 1113

Course Description

The course topics include; bacterial DNA replication, transcription, translation, mutation and variation, introduction to the genetical intermixing of bacteria including transformation, transduction and conjugation. Microbiology of water and wastewaters is studied as a source of infection and methods of water purification, along with Methods of sewage treatment and disposal. The course introduction to food and dairy microbiology, include methods of food preservation, food intoxication and food-infection. Microbiology of soil with particular reference to nitrogen cycle and microbiology of air. Pathogenesis of microorganism and molecular mechanism of pathogenesis and bacterial, fungal and viral diseases also covered.

Equivalent Course(s)

None

Course Name	Physiology-II	**Credit Hours**	**3** (2,1)
Course Code	BIO 2305	**Prerequisite(s)**	BIO 1206

Course Description

This course will cover physiology of gastrointestinal system, central nervous system, autonomic nervous system, peripheral nervous system and special senses which include sense of vision, sense of hearing, sense of pain, sense of taste and sense of smell.

Equivalent Course(s)

None

Course Name	Immunology	**Credit Hours**	**3** (2,1)
Course Code	BIO 3504	**Prerequisite(s)**	None

Course Description

The course topics include; introduction: chronological development and scope of immunology. Immunity and immune responses: Definitions and types (specific and non specific). Humoral and cellular immunity. Complement system. Cells and tissues of immune system. The antigens: structure (simple and complex molecules, proteins and polysaccharides) and immunogenicity. Immunoglobulins: structure and function; classes, subclasses, types and subtypes; immunoglobulin genetics. Immune response to an antigen. Introduction to antigen-antibody reactions: methods for detecting antigens and antibodies (agglutination, precipitation, complement fixation, EIA, etc.). HLA & MHC and its role in immune response, disease and its significance in tissue transplantation. Immunoregulation and tolerance, cancer immunology, hypersensitivity reactions, autoimmune diseases and immunodeficiencies. Immunization (methods of immunization, vaccines and adjuvants).

Equivalent Course(s) None

Course Name	Molecular Biology	**Credit Hours**	**3** (2,1)
Course Code	BIO 4803	**Prerequisite(s)**	BIO 1209, BIO 1101

Course Description

The course topics include; overview of Molecular Biology, logic of Molecular Biology, types and functions of various DNA and RNA polymerases, types and functions of Endonucleases and Exonucleases, Plasmid, Vectors types and functions, transfer of specific genetic material in host and its expression, Molecular techniques for Gene Amplification, techniques for DNA sequencing, techniques for identification of Genetic disorders and infectious diseases e.g. HBV, HCV, HAV, HIV, Tuberculosis, Typhoid, etc.

Equivalent Course(s) None

Course Name	Humanities	**Credit Hours**	**3** (3,0)
Course Code	BIO 2409	**Prerequisite(s)**	None

Course Description

The course includes an introduction to the humanities through a review of some of the major developments in human culture. The goal is to analyze how societies express themselves through literature, art, music, philosophy, and technology. Focus is on developing the conceptual tools to understand cultural phenomena critically.

Equivalent Course(s) None

Course Name	Genetics	**Credit Hours**	**3** (2,1)
Course Code	BIO 3503	**Prerequisite(s)**	BIO 4803

Course Description

The course topics include; Mendelian genetics, principle of segregation, symbols and terminology, monohybrid crosses, dominance, recessiveness, codominance, semidominance, principle of independent assortment, dihybrid ratios, trihybrid ratios, gene interaction, epistasis, and multiple alleles. ABO blood type alleles in humans, Rh factor alleles in humans, probability in Mendetion inheritance, chi-square, structure of chromosomes and genes, DNA as storage of genetic information, Friedrich Miescher Experiment, Avery, Macleod and McCarty experiment, Hershey and Chase experiment, Watson and Crick DNA model, sex determination, identification of sex chromosomes, environmental factors and sex determination, linkage and crossing over.

Equivalent Course(s) None

Course Name	Genetic Engineering	**Credit Hours**	**3** (2,1)
Course Code	BIO 2406	**Prerequisite(s)**	None

Course Description

The course topics include; an outline of DNA cloning experiment, cloning vectors including plasmids, bacteriophages, cosmids YAC vectors, shuttle and expression vectors, tumor inducing (TI) plasmids, and DNA libraries, screening methods for gene libraries. Southern and Northern blotting Human genome project, are included in the course, along with stem cells and therapeutic cloning and social considerations.

Equivalent Course(s) None

Course Name	Biotechnology-I	**Credit Hours**	**3** (2,1)
Course Code	BIO 3507	**Prerequisite(s)**	BIO 4803, BIO 2309

Course Description

The course topics include: history, importance, screening and selection of microorganisms of industrial importance, development and maintenance of pure cultures, microbial growth dynamics, effect of environments on microbial activity, culture preservation and maintenance, strain improvement, screening, enrichment, protoplast fusion, gene cloning, inoculum, development, size and physiological state, mixed cultures and substrate system, tissue culture, nano-biotechnology, principles of methods and their application in industry and agricultural, biomedical, and environmental biotechnology.

Equivalent Course(s) None

Course Name	Hematology	**Credit Hours**	**3** (2,1)
Course Code	BIO 2405	**Prerequisite(s)**	BIO 2305, BIO 1206

Course Description

The course topics include; ABO and Rhesus blood group system, types of blood cells and their functions, formation and maturation of blood cells, general principles and iron metabolism, hematological disorders, hereditary spherocytosis, anaemia, types of anaemia, neutropenia, Hodgkin's disease, idiopathic and thrombotic purpura, thalassemia and its types, hematology laboratory procedures, clotting mechanisms and disorders, and detection of coagulation disorders.

Equivalent Course(s) None

Course Name	Bioethics	**Credit Hours**	**3** (3,0)
Course Code	BIO 4801	**Prerequisite(s)**	None

Course Description

The course topics include; why study Bioethics, Introduction (Definition, branches, Oaths & laws relating to Medical Profession), Ethical Issues in Organ transplantation & artificial insemination and Assisted Reproductive Technology (ART), Ordinance/Laws pertinent Gender sensitivity/women issues, such as: Hadood Ordinance, Swara + Vanni, Karo-Kari, Taboos against divorced women/widow, Female feticide, Physical violence against women, Fatal/lethal burns to married/unmarried women, Assessment process and intervention strategies by medical professionals, Medical negligence and medical malpractice, Patients' rights, Consent to Medical Examination and Treatment, Global ethical issues, Other ethical issues, such as: Child abuse and molestation, The practice of alternate medicine, Quackery, Pakistan ethical issues verses global ethical issues, Religious perspective (commonality), Ethical dilemmas at workplace, Flesh trade, Child labor, Myths and ethics.

Equivalent Course(s) None

Course Name	Pharmacology-I	**Credit Hours**	**3** (2,1)
Course Code	BIO 3505	**Prerequisite(s)**	BIO 1206, BIO 2305

Course Description

The course topics include; introduction, history of pharmacology and its classification, drugs and their sources, routes of drugs administration, advantages and disadvantages of enteral routes, advantages and disadvantages of parenteral routes, advantages and disadvantages of topical routes, pharmacokinetics, drug solubility and passage of drugs across the body membranes, plasma concentration of drugs and various factors affecting it (absorption and factors influencing the rate of absorption, GIT and other routes) of drugs, distribution and factors influencing the rate of distribution of drugs, biotransformation and factors influencing the rate of biotransformation of drugs, excretion, channels of excretion and factors influencing the rate of excretion of drugs, definition of bioavailability and bioequivalence, therapeutic index, plasma half life (t½), dose-response curve, area under curve, volume of distribution, pharmaco dynamics, drug receptors and theories, mechanisms of drug action, specificity of drug action and factors modifying the action and dosage of drugs.

Equivalent Course(s) None

Course Name	Psychology	**Credit Hours**	**3** (3,0)
Course Code	BIO 2306	**Prerequisite(s)**	None

Course Description

The course topics include why study psychology, nature and application of psychology with special reference to Pakistan, schools of psychology, methods of psychology, biological basis of behavior and sensation, perception and attention. It helps distinguish between the major perspectives on human thought and behavior and appreciate the variety of ways psychological data are gathered and evaluated. The course also entails gaining insight into human behavior and into one's own personality or personal relationships, exploring the ways that psychological theories are used to describe, understand, predict, and control or modify behavior, motives, emotions, learning, memory and thinking, impact of behavior on organization, how do the tools of psychology improve work output, social medicine, and social evils.

Equivalent Course(s) SS 2306, BA 2312, MD 2424, BA 2306, SS 2306, AF 2303, EN 1104

Course Name	Basic Endocrinology	**Credit Hours**	**3** (3,0)
Course Code	BIO 2407	**Prerequisite(s)**	BIO 1206, BIO 2305

Course Description

The course topics include; hormones and chemical signals, receptors, basic principle of endocrine physiology, synthesis, secretion and mode of action of various hormones, hormonal control of metabolism, hypothalamic and pituitary hormones, thyroid glands and its hormones; adrenal glands and its hormones, calcium hemostasis, hormonal assays, and hormonal control of reproduction in males and females.

Equivalent Course(s) None

Course Name	Biotechnology-II	**Credit Hours**	**3** (2,1)
Course Code	BIO 3607	**Prerequisite(s)**	BIO 2302

Course Description

The course topics include; advances in vaccine development, recombinant products expression and transgenic, bioreactor design, introduction to factors affecting bioreactor design, description of a typical aseptic bioreactor, bioreactor configurations and scale-up of bioreactor system, design of sterilization systems, oxygen mass transfer and heat transfer in bioreactor systems, fermentation technology, product recovery, waste treatment and safety, biosensors (applications of biosensors, transducer technology, principles of biosensors), recombinant protein production, general aspects of heterologous protein expression, bacterial expression systems-*Escherichia coli* and *Bacillus subtilis, Saccharomyces cerevisiaea* a system for expression of heterologous proteins, expression in non-saccharomyces yeast species and filamentous fungi, enzymes and industry, extremozymes, enzyme evolution, and microbial productions of pharmaceuticals, diagnostic proteins, vaccines, microbial toxins and insecticides

Equivalent Course(s) None

6.1. Bachelor of Science in Biosciences (BS-Biosciences)

Course Name	Agricultural Science	**Credit Hours**	**3** (3,0)
Course Code	BIO 3601	**Prerequisite(s)**	BIO 2406, BIO 2302

Course Description

The course topics include; Agricultural systems (definitions, history, domestication), the concepts of plant molecular markers, historical background of tissue culture, requirements for in-vitro cultures, role of Phyto-hormones in somatic embryogenesis, Somaclonal variations as breeding tool, Somatic Hybridization, commercial application and issues related to tissue culture, plant transformation, gene gun method of transformation, *Agrobacterium*-mediated transformation, PEG mediated transformation, field evaluation and commercialization, transgenic crops for herbicide, biotic and abiotic stress resistance, introduction to bio fertilizers, biosafety concerns and bioethics on GM crops, and ethical issues in sustainable agriculture and agricultural research

Equivalent Course(s) None

Course Name	Nutrition and Dietetics	**Credit Hours**	**3** (3,0)
Course Code	BIO 2304	**Prerequisite(s)**	BIO 2301, BIO 1206

Course Description

The course topics include; what is and why study nutrition and dietetics, role of nutrition and dietetics in health and how it helps in health, energy and protein, carbohydrates and fats, water soluble vitamin, fat soluble vitamins, minerals RDA/dietary guidelines, nutrition in pregnancy and lactation, nutrition in the growing years, nutrition in adult and elderly, nutrition problem in Pakistan, nutritional assessment, principle of diet therapy in patients, diet in body weight control, diabetes mellitus, hypertension, cardiovascular disease, cancer, osteoporosis, renal disease and food service management in hospitals, and screening of deficiencies

Equivalent Course(s) None

Course Name	Pharmacology-II	**Credit Hours**	**3** (2,1)
Course Code	BIO 3605	**Prerequisite(s)**	BIO 3505

Course Description

The course topics include; drugs acting on central nervous systems– depressants, hypnotic and sedatives and analgesics (narcotic analgesics and opioid antagonists, analgesic, antipyretic and anti-inflammatory drugs, chemotherapy, anti-microbials, sulphonamides, anti-virals, anti-protozoals treatment of malaria and treatment of amebiasis), anti-fungals, anthelmintics, penicillins, cephalosporins, aminoglycosides, tetracyclines, chloramphenicol, macrolides, quinolones and miscellaneous anti-biotics.

Equivalent Course(s) None

6.1. Bachelor of Science in Biosciences (BS-Biosciences)

Course Name	Research Methodology	**Credit Hours**	**3** (3,0)
Course Code	BIO 4703	**Prerequisite(s)**	BIO 4801, BIO 2404

Course Description	The course topics include; problem identification, problem statement, objectives, literature review and referencing, conceptual framework/hypotheses, planning, methods and procedures, presenting professional papers, introduction to data collection and analysis, statistical measures, hypothesis testing, linear regression and analysis of variance in application oriented manner, data collection methods using various instruments, analysis of experimental and quasi-experimental methods, and presentation of research findings.
Equivalent Course(s)	CSC 5105, MPH 5205

Course Name	Business Management	**Credit Hours**	**3** (3,0)
Course Code	BIO 4701	**Prerequisite(s)**	None

Course Description	The course topics include; basic business decisions, defining, assessing and choosing options, laying the foundations, market research, understanding and reaching customers, cost and profit analysis, finances and assets, competitors and constraints, writing a business plan, running your business; selling techniques and business promotions, e-marketing and online selling, customer satisfaction, price and budgeting; cash flow and book-keeping, and negotiating and legal aspects of small businesses
Equivalent Course(s)	None

Course Name	Research Report-I Research Report-II	**Credit Hours**	**6** (0,3)+(0,3)
Course Code	BIO 4705 BIO 4805	**Prerequisite(s)**	BIO 2401, BIO 1207 BIO 2305, BIO 4803

Course Description	A Biosciences related research project is to be conducted, in which candidates are required to do a short lab experiment, and present their findings in terms of research report and power point presentations.
Equivalent Course(s)	None

6.1.1 Bachelor of Science in Biosciences (BS-Biosciences)

Course Name	Animal and Plant Tissue Culture	**Credit Hours**	**3** (2,1)
Course Code	BIO 2309	**Prerequisite(s)**	None

Course Description

The course topics include;Introduction and history of plant tissue culture; design of typical tissue culture laboratory, basic media and their components. Culture initiation; explants; type of explants, preparation of explant and their sterilization. Callus culture, cell culture, and single cell culture. Synseeds or synthetic seeds production. Somaclonal variation; problems and benefits. Protoplast culture and Somatic hybridization. Somatic Embryo Production (Somatic Embryogeneis); Principles, technology of automation and the application. Production of natural products by plant cell, tissue and organ culture. Introduction to animal tissue culture, history and application of cell and tissue culture, different types of cell culture, Isolation of cells for culture, factors effecting the growth of cultured cell, contact inhibition, subculturing, establishment of cell line, cryopreservation , Characterization and validation

Equivalent Course(s) None

Course Name	Bioinformatics	**Credit Hours**	**3** (2,1)
Course Code	BIO 2402	**Prerequisite(s)**	BIO 1104

Course Description

The course topics include; bioinformatics approach to study molecular to organism level of biological hierarchical structure, application of computational tools to the analysis of genome and their gene products, protein structure, classification, mechanism of protein folding and folding pathways and role of chaperones in protein folding, experimental techniques for characterizing membrane, introduction to sequence databases, comparing sequences against sequence databases, predicting protein coding and non coding regions. Additional topics include; prediction of protein structure from sequencing data, phylogenetic analysis, genome sequencing projects, bioinformatics, and genome analysis.

Equivalent Course(s) CSC 4707

Course Name	Environmental Science	**Credit Hours**	**3** (2,1)
Course Code	BIO 2403	**Prerequisite(s)**	None

Course Description

The course topics include; Environmental Sciences study of inter-relationship, matter, energy and environment, risk assessment, ecosystems and communities, biogeochemical cycle, population characteristics and issues, energy, biodiversity, land use planning, agricultural methods and pest management, water management, air quality issues, solid waste management and disposal, environmental regulations, hazardous substances and wastes.

Equivalent Course(s) None

6.1.1 Bachelor of Science in Biosciences (BS-Biosciences)

Course Name	Biophysics	**Credit Hours**	**3** (3,0)
Course Code	BIO 4802	**Prerequisite(s)**	BIO 1206

Course Description

The course topics include; Introduction to basic concepts of biophysics, physicist and biologist approaches to biophysics, water, biostructures, assemblies of biomolecules, physical sketch of cell, light and life, photosynthesis, UV effects on biosystems, mechanics and dynamics, physics of reactions, molecular machines, assembly, and biostructures.

Equivalent Course(s) None

Course Name	Epidemiology	**Credit Hours**	**3** (3,0)
Course Code	BIO 3509	**Prerequisite(s)**	None

Course Description

The course topics include; Dynamics of disease transmission, measures of disease impact, disease surveillance, validity and reliability of diagnostic tests, natural history of disease, cohort studies and case controls with other design, risk and association, bias with cofounding and interaction, genetic and environmental factors in disease causation, epidemiology to evaluate health services with screening programs and public policy, ethical and professional issues in Epidemiology.

Equivalent Course(s) None

6.1 Bachelor of Science

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Students enrolled in Bachelor of Science in Biotechnology (BS BTC) program are required to complete 46 courses and a research report with a minimum of 136 credit hours, within seven (7) years to become eligible for obtaining the BS degree in Biotechnology. The break-up of 46 courses is as follows:

- *41 Compulsory Courses (118 credit hours)*
- *4 Electives[35] (12 credit hours)*
- *1 Research Report (6 credit hours)*

35-List of Electives is given in Appendix B.

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Code	Course Title	Page #
	Third Year	
	Fall Semester	
BTC 3508	Sociology	235
BTC 3504	Introduction to Biotechnology	235
BTC 3503	Enzymology	235
BTC 3507	Genetic Resources Conservation	236
BTC 3506	Psychology	236
	Spring Semester	
BTC 3603	Industrial Biotechnology	236
BTC 3601	Agriculture Biotechnology	237
BTC 3607	Analytical Chemistry & Instrumentation	237
BTC 3606	Research Methodology	237
BTC 3604	Medical Biotechnology	238
	Fourth Year	
	Fall Semester	
BTC 4705	Research Report-I	238
BTC 4704	Methods in Molecular Biology	238
BTC 4702	Bioinformatics	239
BTC 3505	Principles of Biochemical Engineering	239
BTC 4xxx	Elective-I	-
BTC 4xxx	Elective-II	-
	Spring Semester	
BTC 4801	Biological physics	239
BTC 4805	Research Report-II	240
BTC 4802	Environmental Biotechnology	240
BTC 4803	Food Biotechnology	240
BTC 4xxx	Elective-III	-
BTC 4xxx	Elective-IV	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Compulsory Courses

Course Name	Cell Biology	**Credit Hours**	**3** (2,1)
Course Code	BTC 1105	**Prerequisite(s)**	None

Course Description

Introduction to cell theory including historical perspective; overview of membrane structure and chemical constituents of the cell; function, isolation and molecular organization of cellular organelles specifically the endoplasmic reticulum, lysosome, micro-bodies, mitochondrial ultra-structure and function, chloroplast ultra-structure and the mechanism of photosynthesis; composition and structure of membranes; membrane receptors and transport mechanisms; cell movement - structure and function of cytoskeleton, centriole, cilia and flagella; nucleus; structure and function of chromosomes; cell cycle, mitosis and meiosis.

Equivalent Course(s) None

Course Name	English for General Purposes	**Credit Hours**	**3** (3,0)
Course Code	BTC 1106	**Prerequisite(s)**	None

Course Description

The course is aimed at improving English language communication and presentation skills of students. With a multidimensional approach, the course enables the students to practice the use of English in everyday situations, building upon all four skills: listening, speaking, reading and writing. It prepares them to participate in seminars and discussions and make effective presentations, with an awareness of the audience and effective use of verbal and non-verbal communication. The course addresses the basic English language issues faced by the learners, while also aiming to foster in them, critical skills to develop a concise and clear argument, respond to others' comments and negotiate their own point of view persuasively. The course uses an interactive, participatory methodology, to engage learners' interest and boost their confidence to use English in everyday communication in formal and informal contexts.

Equivalent Course(s) None

Course Name	Mathematics-I (Pre-Calculus)	**Credit Hours**	**3** (3,0)
Course Code	BTC 1103	**Prerequisite(s)**	None

Course Description

Preliminaries: Real-number system, complex numbers, introduction to sets, set operations, functions, types of functions. Matrices: Introduction to matrices, types, matrix inverse, determinants, system of linear equations, Cramer's rule. Quadratic Equations: Solution of quadratic equations, qualitative analysis of roots of a quadratic equations, equations reducible to quadratic equations, cube roots of unity, relation between roots and coefficients of quadratic equations. Sequences and Series: Arithmetic progression, geometric progression, harmonic progression. Binomial Theorem: Introduction to mathematical induction, binomial theorem with rational and irrational indices. Trigonometry: Fundamentals of trigonometry, trigonometric identities.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	Biosafety & Bioethics	**Credit Hours**	**3** (2,1)
Course Code	BTC 1101	**Prerequisite(s)**	None

Course Description

Introduction to Biosafety - definition, concept, uses and abuses of genetic information, and biohazards; good laboratory practices; risks related to genetically modified organisms (GMO); international rules and regulations for biosafety and GMOs; introduction to bioethics; ethical issues related to GMOs; euthanasia, reproductive and cloning technologies, transplants and eugenics; patenting, commercialization and benefit sharing; role of national bioethics committees; biosafety guidelines from a national perspective; introduction to lab management, quality management systems, health safety in laboratories, work safety legislations, animal biosafety consideration, fire safety and risk assessment, hazards of biological waste and disposal, basic principles of biosafety, levels of biosafety, biocontainment of genetically modified organisms, packing and shipment of biological materials.

Equivalent Course(s) None

Course Name	Organic Chemistry	**Credit Hours**	**3** (2,1)
Course Code	BTC 1104	**Prerequisite(s)**	None

Course Description

Basic Concepts of Organic Chemistry: Bonding and hybridization, localized and delocalized bonding, structure-aromaticity, inductive effect, dipole moment, resonance and its rules, hyper conjugation, classification and nomenclature of organic compounds including IUPAC system, types of organic reactions (an overview). Chemistry of Hydrocarbons: Saturated and unsaturated hydrocarbons with emphasis on free radical, electrophilic addition and electrophilic substitution reactions. Chemistry of Functional Groups: preparation and properties of alcohols, phenols, ethers, and amines with focus on reaction mechanism and applications, preparations and reaction mechanism of aldehydes and ketones and their applications, carboxylic acids and their derivatives, acidity of carboxylic acids and effect of substituents on their acidity, preparation and reactions of carboxylic acids and their derivatives including esters, amides, acid halides and acid anhydrides.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	Islamic Studies	**Credit Hours**	**2**(2,0)
Course Code	BTC 1102	**Prerequisite(s)**	None

Course Description

Introduction to Quran Studies
- 1) Basic Concepts of Quran
- 2) History of Quran
- 3) Uloom-ul -Quran

Study of Selected Text of Holly Quran
- 1) Verses of Surah Al-Baqra Related to Faith(Verse No-284-286)
- 2) Verses of Surah Al-Hujrat Related to Adab Al-Nabi (Verse No-1-18)
- 3) Verses of Surah Al-Mumanoon Related to Characteristics of faithful (Verse No-1-11)
- 4) Verses of Surah al-Furqan Related to Social Ethics (Verse No.63- 77)
- 5) Verses of Surah Al-Inam Related to Ihkam(Verse No-152-154)

Study of Selected Text of Holly Quran
- 1) Verses of Surah Al-Ihzab Related to Adab al-Nabi (Verse No.6,21,40,56,57,58.)
- 2) Verses of Surah Al-Hashar (18,19,20) Related to thinking, Day of Judgment
- 3) Verses of Surah Al-Saf Related to Tafakar,Tadabar (Verse No- 1,14)

Seerat of Holy Prophet (S.A.W) I
- 1) Life of Muhammad Bin Abdullah (Before Prophet Hood)
- 2) Life of Holy Prophet (S.A.W) in Makkah
- 3) Important Lessons Derived from the life of Holy Prophet in Makkah

Seerat of Holy Prophet (S.A.W) II
- 1) Life of Holy Prophet (S.A.W) in Madina
- 2) Important Events of Life Holy Prophet in Madina
- 3) Important Lessons Derived from the life of Holy Prophet in Madina

Introduction to Sunnah
- 1) Basic Concepts of Hadith
- 2) History of Hadith
- 3) Kinds of Hadith
- 4) Uloom –ul-Hadith
- 5) Sunnah & Hadith
- 6) Legal Position of Sunnah

Selected Study from Text of Hadith

Introduction to Islamic Law & Jurisprudence
- 1) Basic Concepts of Islamic Law & Jurisprudence
- 2) History & Importance of Islamic Law & Jurisprudence
- 3) Sources of Islamic Law & Jurisprudence
- 4) Nature of Differences in Islamic Law
- 5) Islam and Sectarianism

Islamic Culture & Civilization
- 1) Basic Concepts of Islamic Culture & Civilization
- 2) Historical Development of Islamic Culture & Civilization
- 3) Characteristics of Islamic Culture & Civilization
- 4) Islamic Culture & Civilization and Contemporary Issues

Islam & Science
- 1) Basic Concepts of Islam & Science
- 2) Contributions of Muslims in the Development of Science
- 3) Quranic & Science

Islamic Economic System
- 1) Basic Concepts of Islamic Economic System
- 2) Means of Distribution of wealth in Islamic Economics
- 3) Islamic Concept of Riba
- 4) Islamic Ways of Trade & Commerce

Political System of Islam
- 1) Basic Concepts of Islamic Political System
- 2) Islamic Concept of Sovereignty
- 3) Basic Institutions of Govt. in Islam

Islamic History
- 1) Period of Khlaft-E-Rashida
- 2) Period of Ummayyads
- 3) Period of Abbasids

Social System of Islam
- 1) Basic Concepts Of Social System Of Islam
- 2) Elements Of Family
- 3) Ethical Values Of Islam

Equivalent Course(s)	None

Course Name	Microbiology	**Credit Hours**	**3**(2,1)
Course Code	BTC 1204	**Prerequisite(s)**	None

Course Description	Overview and history of microbiology including microbial diversity (Archaea, bacteria, fungi, algae, protozoa), nutrition, growth, metabolism; cultivation; viruses; control of microorganisms: sterilization and disinfection, antimicrobial agents, antibiotics, antibiotic resistance and susceptibility, antifungal and antiviral agents; cell death; symbiosis, carbon, nitrogen, sulfur and phosphorus cycles; microbiology of soil, freshwater and seawater.
Equivalent Course(s)	None

Course Name	Biochemistry-I	**Credit Hours**	**3**(2,1)
Course Code	BTC 1201	**Prerequisite(s)**	None

Course Description	Introduction to biochemistry; water, pH, buffers, and biochemical composition of cells; carbohydrates - structure and classification; proteins - overview with emphasis on their composition and structure, classification and function; lipids - structure, classification and biological significance; enzymes - properties, nomenclature, classification, and factors affecting enzyme activity including inhibitors and potentiators, basic kinetics, derivation of Km and Vmax; coenzymes and vitamins; nucleic acids - structure and function.
Equivalent Course(s)	None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	English for Academic Purposes	**Credit Hours**	**3**(3,0)
Course Code	BTC 1202	**Prerequisite(s)**	None

Course Description

The course is designed to improve academic English language and study skills of students. The course follows a multidimensional approach based on the four language skills with a specific focus on reading and writing skills that are required in research-based study at university level. The course includes listening and note taking skills, library and internet use for locating and evaluating research articles. In addition, the course seeks to enable the students to of speed read, skim, scan and infer from written text. The course specifically focuses on enabling the students to experiment with complex grammatical forms, sentence structures and logical paragraph development, to present coherent, cohesive and effective arguments clearly in research-based writing according to the requirements of their specific discipline.

Equivalent Course(s) None

Course Name	Inorganic Chemistry	**Credit Hours**	**3**(2,1)
Course Code	BTC 1206	**Prerequisite(s)**	None

Course Description

Chemical Bonding: Types of chemical bonding, ionic and covalent bonding, localized bond approach, theories of chemical bonding, valance bond theory (VBT), hybridization and resonance, prediction of molecular shapes using Valence Shell Electron Pair Repulsion (VSEPR) model, molecular orbital theory (MOT) applied to diatomic molecules, delocalized approach to bonding, bonding in electron deficient compounds, hydrogen bonding. Acids and Bases: Brief concepts of chemical equilibrium, acids and bases including soft and hard acids and bases (SHAB), relative strength of acids and bases, significance of pH, pKa, pKb and buffer solutions, theory of indicators, solubility, solubility product, common ion effect and their industrial applications. p-Block Elements: Physical and chemical properties of p-block elements with emphasis on some representative compounds, inter-halogens, pseudo-halogens and polyhalides.

Equivalent Course(s) None

Course Name	Probability & Biostatistics	**Credit Hours**	**3**(3,0)
Course Code	BTC 1205	**Prerequisite(s)**	None

Course Description

The course topics include definition of statistics, characteristics, importance and limitations, population and samples, frequency distribution and probabilities, formation of frequency table from raw data, histograms, applications of probabilities to simple events, measures of central tendencies and dispersion, arithmetic mean, median, mode, range, variance and standard deviation, standard error of the mean, mean deviation, semi interquartile range, standard distribution (binomial, poison and normal distributions, properties and application, normality), test of significance (t-test, X2-test, F-test, L.S.D. test, multiple range test), design of experiment, brief account of correlation and regression, and computer based statistical software applications.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	Biomathematics	**Credit Hours**	**3**(3,0)
Course Code	BTC 1203	**Prerequisite(s)**	None

Course Description

This course aims to provide students with the essential concepts of biomathematics and how these can be employed for analyzing real data. Preliminaries: Real-number line, functions and their graphs, solution of equations involving absolute values, inequalities, binomial theorem and its use. Limits and Continuity: Limit of a function, left-hand and right-hand limits, continuity, continuous functions. Derivatives and their Applications: Differentiable functions, differentiation of polynomial, rational and transcendental functions, derivatives. Integration and Definite Integrals: Techniques of evaluating indefinite integrals, integration by substitution, integration by parts, change of variables in indefinite integrals. Application and importance of calculus for biotechnology; the exponential growth curve and growth equation.

Equivalent Course(s) None

Course Name	English for Professional Purposes	**Credit Hours**	**3**(3,0)
Course Code	BTC 2303	**Prerequisite(s)**	None

Course Description

This technical and business writing course focuses on the use of English in professional contexts. The course aims to develop interpersonal communication skills in a dynamic, digitalized and globally connected business world. This interactive course will create an awareness in the students about the basics of communication in formal contexts, allows them to analyze the mechanics of technical business writing with the use of specific registers, and experiment with different types of letters, memos, reports, proposals, presentations, and manuals to communicate complex information with clarity, conciseness, and force to meet the basic business communication needs of working professionals.

Equivalent Course(s) None

Course Name	Microbial Biotechnology	**Credit Hours**	**3**(2,1)
Course Code	BTC 2305	**Prerequisite(s)**	None

Course Description

Issues and scope of microbial biotechnology; genetically modified microorganisms; microbes as tools for microbiological research; biotechnological potential of microbes; significance of microorganisms in food production, fermentation, pharmaceutical and other industries; vaccine development and production; microbiological mining, biofuels and use of microbes in petroleum industry; plant-microbe interactions; bio-fertilizers, biopesticides, composting; antimicrobials; significance of microbial biotechnology in the economic development of Pakistan.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	Introduction to Computer Science	**Credit Hours**	**3**(2,1)
Course Code	BTC 2304	**Prerequisite(s)**	None

Course Description

The course topics include basic computing hardware (input, output, processing and storage devices) and software classification with important historical events; software applications using office automation tools (Word Processor, Spread Sheet, Presentation Software); effective use of internet/intranet; introduction to software/web programming and development, computer networks, information technology within the broader domain of computing, and social issues of computing.

Equivalent Course(s) None

Course Name	Biochemistry-II	**Credit Hours**	**3**(2,1)
Course Code	BTC 2301	**Prerequisite(s)**	None

Course Description

Introduction to metabolism and basic aspects of bioenergetics and biochemical thermodynamics (endergonic and exergonic reactions); phosphoryl group transfer and ATP production; metabolism, oxidation-reduction; carbohydrate metabolism and regulation (glycolysis, glycogenolysis; gluconeogenesis; pentose phosphate pathway); citric acid cycle (reactions, energetics and control), electron transport chain, oxidative phosphorylation, shuttle mechanisms (glycerol-phosphate shunt), lipid metabolism (energy yield from fatty acid oxidation, ketone bodies, acyl glycerol, compound lipids, cholesterol); photosynthesis; Calvin Cycle; metabolism of nitrogenous compounds (amino acid synthesis, catabolism, purine and pyrimidine synthesis); nucleic acid metabolism and control; urea cycle; integration of metabolism.

Equivalent Course(s) None

Course Name	Ecology, Biodiversity & Evolution-I	**Credit Hours**	**3**(2,1)
Course Code	BTC 2302	**Prerequisite(s)**	None

Course Description

Introduction; ecosystem and ecological pyramids; role of environment on phenotype of organisms; food chain, webs and trophic levels; factors influencing environment; impact of urbanization and industry on environment; population: air, water, land, thermal, radiation and noise; community ecology; atmosphere – composition and cycles; pollution; climate change (greenhouse effect and global warming); ozone layer – composition and state across the globe; waste and sewerage processing and disposal; microbes, plants and animal species; comparative study of life forms; features and characteristics of bacteria, archaea and eukaryotes; phylogenetic relationships between the three kingdoms; evolution of different members belonging to each of the three domains of life (with specific examples); models of speciation; causes and consequences of extinction.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	Physical Chemistry	**Credit Hours**	**3**(2,1)
Course Code	BTC 2306	**Prerequisite(s)**	None

Course Description

Chemical Thermodynamics: Equation of states, ideal and real gases, the real gas equation and the van der Waals equation for real gases, critical phenomena and critical constants, four laws of thermodynamics and their applications, thermochemistry, calorimetry, heat capacities and their dependence on temperature, pressure and volume, reversible and nonreversible processes, spontaneous and non-spontaneous processes, relations of entropy and Gibbs free energy with equilibrium constant, Gibbs Helmholtz equation, fugacity and activity. Chemical Equilibrium: General equilibrium expressions, reaction quotients, examples of equilibrium reactions in solid, liquid and gas phases, extent of reactions and equilibrium constants, Gibbs energies of formation and calculations of equilibrium constants, effect of temperature and pressure on the equilibrium constants/compositions, van't Hoff equation, Le-Chatelier's principle. Solution Chemistry: Physical properties of liquids, surface tension, viscosity, refractive index, dipole moment etc. and their applications, brief account of interactions among the molecules in liquids, ideal and nonideal solutions, Raoult's law and its applications, lowering of vapor pressure, elevation of boiling point, depression of freezing point, osmotic pressure, vapor pressure of non-ideal solutions and Henry's law, abnormal colligative properties, degrees of association and dissociation of solutes, osmotic pressure and its measurement, fractional distillation and concept of azeotropic mixtures. Chemical Kinetics: The rates of reactions, zero, first, second and third order reactions with same and different initial concentrations, half-lives of reactions, experimental techniques for rate determination and methods for determination of order of reaction (integration, half-life, initial rate, and graphical methods), Arrhenius equation.

Equivalent Course(s) None

Course Name	Ecology, Biodiversity & Evolution-II	**Credit Hours**	**3**(2,1)
Course Code	BTC 2402	**Prerequisite(s)**	None

Course Description

Introduction to animal kingdom: features of protists, protozoa, annelids, arthropods, myriapods, echinoderms, chordates, amphibians, reptiles and birds. Plant biodiversity – history, importance, usefulness and evolution; importance of plants, their conservation and domestication; improvement of crops; impact of environment on loss of genetic diversity and speciation; in situ and ex situ conservation; evolution of microbes, plants and animals; origin of life; methods of studying evolution; construction of phylogenetic trees on basis of morphology and molecular markers; environmental ethics.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	Immunology	**Credit Hours**	**3**(2,1)
Course Code	BTC 2404	**Prerequisite(s)**	None

Course Description

Overview of the immune system as the body's main defence mechanism; elements of innate and acquired immunity; cells and organs of the immune system; properties of antibodies and antigens together with their structure, function and interactions; genetics of antibody structure and diversity; expression of immunoglobulin genes; VDJ recombination; antigen processing and presentation; major histocompatibility complex; monoclonal and polyclonal antibodies; T-cell receptors, maturation, activation, and differentiation; B-cell generation, activation, and differentiation; complement system, hypersensitivity, cytokines, resistance and immune response to infectious diseases, cell-mediated effector response, leukocyte migration and inflammation, vaccines, diseases of the immune system - autoimmunity, transplantation immunology.

Equivalent Course(s) None

Course Name	Molecular Biology	**Credit Hours**	**3**(2,1)
Course Code	BTC 2405	**Prerequisite(s)**	None

Course Description

Introduction to molecular biology and history; structure and function of DNA; chromatin and structure of chromosomes; protein structure and function; DNA replication in prokaryotes and eukaryotes; transcription in prokaryotes and eukaryotes; post transcriptional processing (e.g., RNA splicing, alternative splicing, editing); genetic code; translation, post-translational processing in prokaryotes and eukaryotes; protein folding, targeting and turnover; DNA 27 damage and repair, recombination and transposable elements. Signaling and control of gene regulation in prokaryotes and eukaryotes.

Equivalent Course(s) None

Course Name	Classical Genetics	**Credit Hours**	**3**(2,1)
Course Code	BTC 2401	**Prerequisite(s)**	None

Course Description

The course includes Classical Mendelian genetics; monohybrid crosses, dominance, recessiveness, co-dominance, and semi-dominance; principle of independent assortment; dihybrid and trihybrid ratios; gene interactions; epistasis and multiple alleles; ABO blood type alleles and Rh factor alleles in humans; probability in Mendelian inheritance; structure of chromosomes; organization of genes and genomes; nucleic acid function; DNA as warehouse of genetic information; experimental evidence that DNA is genetic material; sex determination; linkage and crossing over.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	Pakistan Studies	**Credit Hours**	**2**(2,0)
Course Code	BTC 2407	**Prerequisite(s)**	None

Course Description

1. Historical Perspective

a. Ideological rationale with special reference to Sir Syed Ahmed Khan, Allama Muhammad Iqbal and Quaid-i-Azam Muhammad Ali Jinnah.
b. Factors leading to Muslim separatism
c. People and Land
    i. Indus Civilization
    ii. Muslim advent
    iii. Location and geo-physical features.

2. Government and Politics in Pakistan Political and constitutional phases:

a. 1947-58
b. 1958-71
c. 1971-77
d. 1977-88
e. 1988-99
f. 1999 onward

3. Contemporary Pakistan

a. Economic institutions and issues
b. Society and social structure
c. Ethnicity
d. Foreign policy of Pakistan and challenges
e. Futuristic outlook of Pakistan

Equivalent Course(s) None

Course Name	Genomics & Proteomics	**Credit Hours**	**3**(3,0)
Course Code	BTC 2406	**Prerequisite(s)**	None

Course Description

Organization and structure of genomes; genetic mapping (RFLP, microsatellite, SNP); high-resolution physical mapping (STS, EST); flow cytometry; somatic cell and radiation hybrids; artificial chromosomes in bacteria and yeast; hierarchical and whole genome shotgun sequencing; DNA sequencing strategies – manual and automated sequencing, pyro-sequencing, Solexa, Helicos, Roche 454, realtime and nano-pore sequencing; sequence assembly, obstacles and solutions; estimating gene number – overprediction and under-prediction, homology searches, exon prediction programs, integrated gene-finding software packages; structural variation in the genome and its applications; microarray and RNA interference; proteomics; cellular communication/signalling pathways; protein-protein interactions and validation - yeast two hybrid system, affinity purification-mass spectrometry (AP-MS), tandem affinity purification (TAP) tagging, fluorescence resonance energy transfer (FRET) and coimmunoprecipitation.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	Sociology	**Credit Hours**	**3**(3,0)
Course Code	BTC 3508	**Prerequisite(s)**	None

Course Description

The course focuses on three central themes: social change, social inequality, and social harmony versus conflict. It combines selective theoretical texts with case studies to understand the mechanisms and institutions that can trigger, foster, sustain, or undermine each of the three processes. The course covers the work of major sociological thinkers and the influence of sociology on modernization, race, citizenship, culture, gender, society, and economic development.

Equivalent Course(s) None

Course Name	Introduction to Biotechnology	**Credit Hours**	**3**(2,1)
Course Code	BTC 3504	**Prerequisite(s)**	None

Course Description

Biotechnology- definition and history; foundations of biotechnology and interdisciplinary pursuit; branches and/or applications of biotechnology in medicine, agriculture (food, livestock, fisheries, algae, fungi, etc.); protection of biotechnological products; safety in biotechnology; public perception of biotechnology; biotechnology and ethics; biotechnology and the developing world.

Equivalent Course(s) None

Course Name	Enzymology	**Credit Hours**	**3**(3,0)
Course Code	BTC 3503	**Prerequisite(s)**	None

Course Description

Introduction to enzymes, nomenclature, classification, ribozyme, general characteristics of theories of enzyme catalysis, enzyme and substrate specificity, isozymes, coenzymes, cofactors, regulation of enzyme activity, chemical kinetics and enzyme kinetics, Michaelis-Menten equation, effect of various factors on rate of reactions, inhibition of enzymatic reactions and kinetics, multienzyme system and bisubstrate reactions, catalytic mechanisms, regulatory enzymes, immobilised enzyme and enzyme assays.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	Genetic Resources and Conservation	**Credit Hours**	**3**(3,0)
Course Code	BTC 3507	**Prerequisite(s)**	None

Course Description

Introduction to genetic resources and their significance; plant genetic resources - utilization, opportunities and constraints; strategic role of plant genetic resources in achieving global food security and sustainable agriculture; overview of wild and domesticated genetic resources of Pakistan; genetic diversity in endangered species; genotype-environment interactions; gene pools and genetic boundaries; genetic drift, inbreeding, migration and gene flow; introduction to extinction and its causes; threatened animal and plant species; conservation of genetic resources through mapping of existing biological diversity; assessing conservation status; management strategies; laws and treaties of conservation; quarantine regulations; future prospects of genetic conservation.

Equivalent Course(s) None

Course Name	Psychology	**Credit Hours**	**3**(3,0)
Course Code	BTC 3506	**Prerequisite(s)**	None

Course Description

The course topics include why study psychology, nature and application of psychology with special reference to Pakistan, schools of psychology, methods of psychology, biological basis of behavior and sensation, perception and attention. It helps distinguish between the major perspectives on human thought and behavior and appreciate the variety of ways psychological data are gathered and evaluated. The course also entails gaining insight into human behavior and into one's own personality or personal relationships, exploring the ways that psychological theories are used to describe, understand, predict, and control or modify behavior, motives, emotions, learning, memory and thinking, impact of behavior on organization, how do the tools of psychology improve work output, social medicine, and social evils.

Equivalent Course(s) None

Course Name	Industrial Biotechnology	**Credit Hours**	**3**(3,0)
Course Code	BTC 3603	**Prerequisite(s)**	None

Course Description

Industrial biotechnology – introduction and scope; microorganisms commonly used in industry; media and nutritional requirements of industrial organisms; screening for productive strains and strain improvement; culture collections; fermentation and fermenters; extraction of fermented products; production of beer, wines, spirits and vinegar; use of single cell proteins as food products; biocatalysts; microbial insecticides; production of metabolites: organic acids and amino acids; vaccines and antibiotic production.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	Agriculture Biotechnology	**Credit Hours**	**3**(3,0)
Course Code	BTC 3601	**Prerequisite(s)**	None

Course Description

Agriculture biotechnology and its applications in crop improvements; cell and plant tissue culture methodology; improvement of plants via plant cell culture; plant molecular biomarkers; direct and indirect methods of plant and animal transformation: gene gun method of transformation, Agrobacterium mediated transformation, chloroplast transformation and polyethylene glycol (PEG) mediated transformation; transgenic crops with herbicide, biotic and abiotic stress resistance; problems related to transgenic plants; genetically modified organisms (GMOs); field evaluation and commercialization of GMOs; possible effects of releasing GMOs into the environment; bio-fertilizers, bio-pesticides and their types; non-symbiotic nitrogen fixers; present and future prospects of biofertilizers.

Equivalent Course(s) None

Course Name	Analytical Chemistry and Instrumentation	**Credit Hours**	**3**(2,1)
Course Code	BTC 3607	**Prerequisite(s)**	None

Course Description

Introduction to various analytical techniques; principles and applications of various types of chromatography including paper, thin layer, gel filtration, ion-exchange, affinity, high performance liquid chromatography (HPLC), gas chromatography, GC-MS and LC–MS; spectroscopy types including nuclear magnetic resonance (NMR), visible, ultraviolet, luminescence, flame, atomic absorption, fluorescence, emission and inductively coupled plasma emission spectroscopy (ICPMS); principles and applications of flow cytometry; introduction to X-ray diffraction; general analytical instrumentations and methods of fractionation and characterization of proteins and nucleic acids including dialysis, ultra-filtration, lyophilisation, ultracentrifuge and amino acid analyzer.

Equivalent Course(s) None

Course Name	Research Methodology	**Credit Hours**	**3**(3,0)
Course Code	BTC 3606	**Prerequisite(s)**	None

Course Description

Introduction; unethical academic practices (plagiarism); need of research and research types; extraction and review of literature; identifying a research problem and formulating a hypothesis; designing a study; data collection, interpretation and analysis; writing a research report, project, thesis and/or research article or review; preparing posters; making scientific presentations; intellectual property.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	Medical Biotechnology	**Credit Hours**	**3**(3,0)
Course Code	BTC 3604	**Prerequisite(s)**	None

Course Description

Introduction to health biotechnology; social acceptance of medical biotechnology; molecular basis of disease; molecular and genetic markers; detection of mutations and infectious agents; active and passive immunization; vaccines (live, killed, recombinant DNA vaccines, subunit vaccines, DNA vaccines, edible vaccines); organ transplantation; applications of transgenic animals (animal models of diseases, farming and enhancement of farm animals); drug delivery systems; blood transfusion and grafting techniques; pharmacogenetics; gene therapy; biopharmaceuticals from plants; stem cell technology.

Equivalent Course(s) None

Course Name	Research Report-I	**Credit Hours**	**3**(0,3)
Course Code	BTC 4705	**Prerequisite(s)**	None

Course Description

A Biotechnology related research project is to be conducted, in which candidates are required to do a short lab experiment, and present their findings in terms of research report and power point presentations.

Equivalent Course(s) None

Course Name	Methods in Molecular Biology	**Credit Hours**	**3**(2,1)
Course Code	BTC 4704	**Prerequisite(s)**	None

Course Description

Introduction to recombinant DNA technology; restriction and modifying enzymes; cloning and expression vectors and their types; expression of recombinant proteins and their purification by affinity chromatography; polymerase chain reaction (PCR) - types; (inverse, touch-down, nested, hemi-nested, pit stop, multiplex, reverse transcriptase, RACE, real-time) and its applications; detection of mutations and/or SNPs; DNA fingerprinting; analysis of nucleic acids by gel electrophoresis – horizontal, vertical, pulse field, denaturing gradient gel electrophoresis; analysis of proteins by native and SDS-PAGE; 2-D gels; generation of antibodies and their uses; enzyme-linked immunosorbant assay; Southern, Western, Northern blotting.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	Bioinformatics	**Credit Hours**	**3**(2,1)
Course Code	BTC 4702	**Prerequisite(s)**	None

Course Description

Introduction; bio-computing; biological databases - types and retrieval of nucleic acid (or genomic) or protein sequence information; sequence alignment - pairwise, multiple; phylogenetics; in silico identification of protein motifs and domains; structural bioinformatics of proteins and RNAs including protein modeling and prediction of their interactions with other proteins and small molecules; identification of genes and promoter regions within genomes; networks; strategies for whole genome sequencing and assembly.

Recommended Databases and Tools: 1. NCBI, PDB, EcoCyc, DDBJ, SWISS-PROT, TIGR, KEGG etc. 2. Bioedit, Repeatmasker, PHRED, PHRAP, BLAST, Prosite/BLOCKS/PFAM, CLUSTALW, Emotif, RasMol, Oligo, Primer3, Molscript, Treeview, Alscript, Genetic Analysis Software, Phylip, MEGA4.0 etc.

Equivalent Course(s) None

Course Name	Principles of Biochemical Engineering	**Credit Hours**	**3**(2,1)
Course Code	BTC 3505	**Prerequisite(s)**	None

Course Description

Introduction to microorganisms and biological molecules; principles of enzyme catalysis; methods of enzyme and cell immobilization; enzyme kinetics; internal mass transfer effect on immobilized growth; stoichiometry models of microbial growth; structured model, of microbial growth; bioreactors - continuous stirred tank bioreactors, plug-flow and packed bed bioreactors, imperfect mixing, fed batch bioreactors, gas liquid mass transfer in bioreactors, power requirement for bioreactor, sterilization and heat transfer in bioreactors; introduction to bioproduct recovery; biological product manufacturing; economic analysis of bioprocesses; case study: penicillin.

Equivalent Course(s) None

Course Name	Biological Physics	**Credit Hours**	**3**(3,0)
Course Code	BTC 4801	**Prerequisite(s)**	None

Course Description

Essentials of thermodynamics; concept of entropy, enthalpy and Gibb's free energy; order and disorder in biological systems; molecules, diffusion, random walks and friction; methods of studying macromolecules; interactions of molecules in 3-D space – determining binding and dissociation constants; molecular motors; sedimentation; Reynold's number; chemical forces and self- assembly; physics of ion channels.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Biotechnology (BS-BTC)

Course Name	Research Report-II	**Credit Hours**	**3**(0,3)
Course Code	BTC 4805	**Prerequisite(s)**	None

Course Description	A Biosciences related research project is to be conducted, in which candidates are required to do a short lab experiment, and present their findings in terms of research report and power point presentations
Equivalent Course(s)	None

Course Name	Environmental Biotechnology	**Credit Hours**	**3**(3,0)
Course Code	BTC 4802	**Prerequisite(s)**	None

Course Description	Introduction to environmental biotechnology; fundamentals of biological interventions; genetic manipulation strategies in environmental biotechnology; pollution indicators and pollution control strategies; bioreactors; domestic waste water treatment; industrial effluent treatment; sludge treatment; contaminated 30 land and bioremediation; phytoremediation; landfills and composts; concept of integrated environmental biotechnology; biodegradation and biotransformation of hazardous chemicals; products of environmental biotechnology.
Equivalent Course(s)	None

Course Name	Food Biotechnology	**Credit Hours**	**3**(3,0)
Course Code	BTC 4803	**Prerequisite(s)**	None

Course Description	Food composition, probiotics, fermented foods, food enzymes, colors and additives; overview of metabolic engineering of bacteria for food ingredients; 32 techniques used for production of food ingredients by microbes; genetic modification of plant starches for food applications; biotechnological approaches to improve nutritional quality and shelf life of fruits and vegetables; microbial food spoilage and food borne diseases; detection and control of food borne bacterial pathogens; food safety and quality control; international aspects of quality and safety assessment of food derived by modern biotechnology.
Equivalent Course(s)	None

6.1 Bachelor of Science

6.2.2 Bachelor of Science in Public Health (BS-PH)

Students enrolled in Bachelor of Science in Public Health (BPH) program are required to complete 42 courses (compulsory and electives) and a research report with a minimum of 06 credit hours, within six (6) years to become eligible for obtaining the BS degree in Public Health. The break-up of 42 courses is as follows:

- *38 Compulsory Courses (114 credit hours)*
- *4 Electives[36] (12 credit hours)*
- *1 Research Report (6 credit hours)*

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

36- List of Electives is given in Appendix B.

6.1. Bachelor of Science in Public Health (BS-PH)

Course Code	Course Title	Page #
	Third Year	
	Fall Semester	
BPH 3503	Population Dynamics	251
BPH 3501	Concept of Health and Disease	251
BPH 3502	Health Promotion, Advocacy and Social Mobilization	251
BPH 3505	Community Pediatrics	252
BPH 3506	Fundamental Principles of Infectious Diseases	252
	Spring Semester	
BPH 3604	Non-Communicable Disease Epidemiology	252
BPH 3605	Reproductive Health	253
BPH 3606	Research Methodology	253
BPH 3601	Environment & Occupational Health	253
BPH 3603	Health Policy and Management	254
	Fourth Year	
	Fall Semester	
BPH 4703	Health Planning	254
BPH 4704	Health Professional Education	254
BPH 4702	District Health Management	255
BPH 4709	Research Report-I	-
BPH xxxx	Elective-I	-
BPH xxxx	Elective-II	-
	Spring Semester	
BPH 4805	Mental Health	255
BPH 4803	Health Marketing	255
BPH 4801	Entomology	256
BPH 4809	Research Report-II	-
BPH xxxx	Elective-III	-
BPH xxxx	Elective-IV	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

6.2.2 Bachelor of Science in Public Health (BS-PH)

Compulsory Courses

Course Name	Life Sciences Biology	**Credit Hours**	**3** (3,0)
Course Code	BPH 1103	**Prerequisite(s)**	None

Course Description	The course topics include: Studying Life, Small molecules and chemistry of life, Routine carbohydrates & lipids, Nucleic Acids & origin of life, Cells: The working unit of life, Cell membranes, Cell Communication & Multicellularity, Energy Enzymes & metabolism, Pathway that harvest chemical energy, Photosynthesis, Cell Cycle & Cell division, Inheritance, Genes & Chromosomes, DNA and its role in inheritance, Gene mutation & Molecular Genetics, From DNA to protein: Gene Expression, Regulation of gene expression, Genosomes, Recombinant DNA technology, Gene expression & Development, Gene evolution, Mechanism of evolution, Evolution of gene & genomes, History of life and earth.
Equivalent Course(s)	BIO1101, BTC1105

Course Name	English for General Purposes	**Credit Hours**	**3** (3,0)
Course Code	BPH 1102	**Prerequisite(s)**	None

Course Description	The course is aimed at improving English language communication and presentation skills of students. With a multidimensional approach, the course enables the students to practice the use of English in everyday situations, building upon all four skills: listening, speaking, reading and writing. It prepares them to participate in seminars and discussions and make effective presentations, with an awareness of the audience and effective use of verbal and non-verbal communication. The course addresses the basic English language issues faced by the learners, while also aiming to foster in them, critical skills to develop a concise and clear argument, respond to others' comments and negotiate their own point of view persuasively. The course uses an interactive, participatory methodology, to engage learners' interest and boost their confidence to use English in everyday communication in formal and informal contexts.
Equivalent Course(s)	BTC1106, BIO1111

6.2.2 Bachelor of Science in Public Health (BS-PH)

Course Name	Mathematics	**Credit Hours**	**3** (3,0)
Course Code	BPH 1104	**Prerequisite(s)**	None

Course Description

The course topics include:

Preliminaries: Real-number system, complex numbers, introduction to sets, set operations, functions, types of functions.

Matrices: Introduction to matrices, types, matrix inverse, determinants, system of linear equations, Cramer's rule.

Quadratic Equations: Solution of quadratic equations, qualitative analysis of roots of a quadratic equations, equations reducible to quadratic equations, cube roots of unity, relation between roots and coefficients of quadratic equations.

Sequences and Series: Arithmetic progression, geometric progression, harmonic progression.

Binomial Theorem: Introduction to mathematical induction, binomial theorem with rational and irrational indices.

Trigonometry: Fundamentals of trigonometry and trigonometric identities.

Equivalent Course(s) BTC1103, BIO1107

Course Name	Sociology of Health & Diseases	**Credit Hours**	**3** (3,0)
Course Code	BPH 1105	**Prerequisite(s)**	None

Course Description

The course topics include; Evolution of Health & Healing, Body, Mind, Illness and Environment, Theories, research and debates of medical sociology, Social, environmental and occupational factors in health and illness, The meaning of health and illness from the patient's perspective, The historical transformation of the health professions and the health work force, The social and cultural factors surrounding the creation and labeling of diseases, Disparities in health, access to healthcare, and the quality of healthcare received, Organizational and ethical issues in medicine including rising costs and medical technology; and health care reform.

Equivalent Course(s) BTC 3508, BIO1214

6.2.2 Bachelor of Science in Public Health (BS-PH)

Course Name	Basic Statistics	**Credit Hours**	**3** (3,0)
Course Code	BPH 1101	**Prerequisite(s)**	None

Course Description

The course topics include; Definition of statistics, characteristics, importance and limitations, population and samples, frequency distribution and probabilities, formation of frequency table from raw data, histograms, applications of probabilities to simple events, measures of central tendencies and dispersion, arithmetic mean, median, mode, range, variance and standard deviation, standard error of the mean, mean deviation, semi interquartile range, standard distribution (binomial, poison and normal distributions, properties and application, normality), test of significance (t-test, X2-test, F-test, L.S.D. test, multiple range test), design of experiment, brief account of correlation and regression, and computer based statistical software applications.1

Equivalent Course(s) BTC1205, BIO1208

Course Name	Basic Epidemiology	**Credit Hours**	**3** (3,0)
Course Code	BPH 1201	**Prerequisite(s)**	None

Course Description

The course topics include; Dynamics of disease transmission, measures of disease impact, disease surveillance, validity and reliability of diagnostic tests, natural history of disease, cohort studies and case controls with other design, risk and association, bias with cofounding and interaction, genetic and environmental factors in disease causation, epidemiology to evaluate health services with screening programs and public policy, ethical and professional issues in Epidemiology

Equivalent Course(s) BIO 3509

Course Name	English for Academic Purposes	**Credit Hours**	**3** (3,0)
Course Code	BPH 1204	**Prerequisite(s)**	None

Course Description

The course is designed to improve academic English language and study skills of students. The course follows a multidimensional approach based on the four language skills with a specific focus on reading and writing skills that are required in research-based study at university level. The course includes listening and note taking skills, library and internet use for locating and evaluating research articles. In addition, the course seeks to enable the students to of speed read, skim, scan and infer from written text. The course specifically focuses on enabling the students to experiment with complex grammatical forms, sentence structures and logical paragraph development, to present coherent, cohesive and effective arguments clearly in research-based writing according to the requirements of their specific discipline.

Equivalent Course(s) BIO1211, BTC1202

6.2.2 Bachelor of Science in Public Health (BS-PH)

Course Name	Biostatistics	**Credit Hours**	**3** (2,1)
Course Code	BPH 1202	**Prerequisite(s)**	BPH 1101

Course Description

The course topics include; Introduction to Biostatistics and its Application in Research, Data: its Types, Sources and uses, Organizing and Displaying Data, Measures of Central Tendency and Measures of Dispersion, Introduction to Statistical Software, Probability, Normal Distribution, Sampling Techniques, Confidence Intervals for Mean, Confidence Intervals for Proportion, Hypothesis Testing, Introduction to Tests of Significance, Correlation and Regression.

Equivalent Course(s) CSC 2105, BA 3605, BA 5405, BA 5305, BA 2305, BIO 1208, AF 2406, EN 2304, BST 1206

Course Name	Community Services	**Credit Hours**	**3** (3,0)
Course Code	BPH 1203	**Prerequisite(s)**	None

Course Description

The course topics include why study psychology, nature and application of psychology with special reference to Pakistan, schools of psychology, methods of psychology, biological basis of behavior and sensation, perception and attention. It helps distinguish between the major perspectives on human thought and behavior and appreciate the variety of ways psychological data are gathered and evaluated. The course also entails gaining insight into human behavior and into one's own personality or personal relationships, exploring the ways that psychological theories are used to describe, understand, predict, and control or modify behavior, motives, emotions, learning, memory and thinking, impact of behavior on organization, how do the tools of psychology improve work output, social medicine, and social evils.

Equivalent Course(s) None

Course Name	Principles of Psychology	**Credit Hours**	**3** (3,0)
Course Code	BPH 1205	**Prerequisite(s)**	None

Course Description

The course topics include why study psychology, nature and application of psychology with special reference to Pakistan, schools of psychology, methods of psychology, biological basis of behavior and sensation, perception and attention. It helps distinguish between the major perspectives on human thought and behavior and appreciate the variety of ways psychological data are gathered and evaluated. The course also entails gaining insight into human behavior and into one's own personality or personal relationships, exploring the ways that psychological theories are used to describe, understand, predict, and control or modify behavior, motives, emotions, learning, memory and thinking, impact of behavior on organization, how do the tools of psychology improve work output, social medicine, and social evils.

Equivalent Course(s) BIO 2306, BTC 3506

6.2.2 Bachelor of Science in Public Health (BS-PH)

Course Name	English for Professional Purposes	**Credit Hours**	**3** (3,0)
Course Code	BPH 2303	**Prerequisite(s)**	None

Course Description

This technical and business writing course focuses on the use of English in professional contexts. The course aims to develop interpersonal communication skills in a dynamic, digitalized and globally connected business world. This interactive course will create an awareness in the students about the basics of communication in formal contexts, allows them to analyze the mechanics of technical business writing with the use of specific registers, and experiment with different types of letters, memos, reports, proposals, presentations, and manuals to communicate complex information with clarity, conciseness, and force to meet the basic business communication needs of working professionals.

Equivalent Course(s) BIO 2411, BTC 2303

Course Name	Basic Computer Skills	**Credit Hours**	**3** (2,1)
Course Code	BPH 2031	**Prerequisite(s)**	None

Course Description

The course topics include; basic computing hardware (input, output, processing and storage devices) and software classification with important historical events; software applications using office automation tools (Word Processor, Spread Sheet, Presentation Software); effective use of internet/intranet; introduction to software/web programming and development, computer networks, information technology within the broader domain of computing, and social issues of computing.

Equivalent Course(s) BIO 1104, BTC 2304

Course Name	Community Nutrition	**Credit Hours**	**3** (3,0)
Course Code	BPH 2302	**Prerequisite(s)**	None

Course Description

The course topics include; Introduction to Human Nutrition and Balanced Diet, Identification of Population at Risk, Factors Contributing to Community Nutritional Disorders, Healthy Nutrition for Pregnant Women, Lactating Mothers and Children, Problems Related to Procurement, Storage, Supply and Distribution of Food to the Vulnerable Groups, Adequate Supply of Food (quality and quantity), International Food Organizations (WFO etc), Politics in Food Supply, Food Supply to Drought , Earthquake, War and Refugees, Management of Nutritional Disorder Diseases in Communities.

Equivalent Course(s) BIO 2304

6.2.2 Bachelor of Science in Public Health (BS-PH)

Course Name	Pakistan Studies	**Credit Hours**	**3** (3,0)
Course Code	BPH 2305	**Prerequisite(s)**	None

Course Description

The course topics include; Historical Perspective: Ideological rationale with special reference to Sir Syed Ahmed Khan, Allama Muhammad Iqbal and Quaid-i-Azam Muhammad Ali Jinnah, Factors leading to Muslim separatism. Government and Politics in Pakistan: Political and constitutional phases of 1947-58, 1958-71, 1971-77, 1977-88, 1988-99, 1999 onward. Contemporary Pakistan: Economic institutions and issues, Society and social structure, Ethnicity, Foreign policy of Pakistan and challenges, Futuristic outlook of Pakistan.

Equivalent Course(s) ME 2306, BTC 2407

Course Name	Primary Health Care	**Credit Hours**	**3** (3,0)
Course Code	BPH 3504	**Prerequisite(s)**	None

Course Description

The course topics include;
Introduction and Philosophy of PHC & HFA, Principles of PHC, Essential components of PHC, Barriers in implementation of PHC, Organization of PHC Services in Pakistan-1, Introduction to MDG's and SDG's, Introduction to National Health Programs.

Equivalent Course(s) None

Course Name	Personal Hygiene	**Credit Hours**	**3**(3,0)
Course Code	BPH 2306	**Prerequisite(s)**	None

Course Description

The course topics include; Introduction to Personal Hygiene, Hand wash, Eye hygiene, Hair hygiene, Body hygiene, Oral hygiene, Nails and cuticles, Feet and shoes, Protection from noise and UV Light, Control of foul odor, Role of personal hygiene in communicable and Non communicable diseases, Types of cleanliness (intrinsic & extrinsic), Prevention of cough cold and other contagious disease, Smoking and protecting rights of others, Personal hygiene at home, Clothes, Kitchen, Washroom, Personal hygiene at schools, Personal hygiene at surroundings, Personal hygiene at work place, Cleanliness and religion.

Equivalent Course(s) None

6.2.2 Bachelor of Science in Public Health (BS-PH)

Course Name	Microbiology	**Credit Hours**	**3** (2,1)
Course Code	BPH 2402	**Prerequisite(s)**	None

Course Description

The course topics include; Fundamentals of Microbiology, Microorganisms and their respective place in the living world, differentiation between prokaryotic and eukaryotic cells, historical development of Microbiology and its scope. Microscopy, morphology, bacterial taxonomy and nomenclature, other topics include growth, nutrition (physical and nutritional requirement and nutritional types, sources of energy, C, N, H, O, S, P, H2O, trace elements, growth factors) and reproduction, general methods of studying microorganisms, including cultivation, isolation, purification and characterization, control of microorganisms by physical and chemical methods. Chemotherapeutic agents and antibiotics, modes of action of antibiotics on microorganisms, basic properties of fungi, protozoa and algae, and a brief introduction to structure and propagation of viruses and bacteriophages. Diagnostic Laboratory testing related to microbiology.

Equivalent Course(s) BIO 1113, BTC 1204

Course Name	Medical Anthropology	**Credit Hours**	**3** (2,1)
Course Code	BPH 2401	**Prerequisite(s)**	None

Course Description

The course topics include;
Introduction of Medical Anthropology, Culture and social aspects of the body, health, sickness and illness in the cross cultural prospective, Effects of culture on health, Medicalization, Authoritative knowledge and belief, Global inequities, The phenomenology of disability, death and role of medical schools, Understanding interpretive approaches, critical theory and phenomenology.

Equivalent Course(s) None

Course Name	Professional Ethicss	**Credit Hours**	**3** (3,0)
Course Code	BPH 2404	**Prerequisite(s)**	None

Course Description

The course topics include; Understanding of the ethical problems and principles, understanding of the professionalism and ethics of other professions: how they interact and what can be expected from them as correct ethical behavior, benefit from a critical scrutiny of their own ethics by those from other professions, The general principles of professional ethics, ethics of several major professions: Business Ethics, Media Ethics, Police Ethics, Medical Ethics, Legal Ethics, and Research Ethics, the nature of a profession, professional codes of ethics, confidentiality, whistle-blowing, the responsibility of business to the environment, uses and abuses of human research, animal ethics in research.

Equivalent Course(s) BIO 4801

6.2.2 Bachelor of Science in Public Health (BS-PH)

Course Name	Parasitology	**Credit Hours**	**3** (3,0)
Course Code	BPH 2403	**Prerequisite(s)**	None

Course Description

The course topics include; Identification of parasites, life cycles, epidemiological factors, host-parasite relationships, immunity to parasites. ***A. Protozoa;*** Plasmodium and Malaria, Entameoba Histolytica and Dysentery, Giardia Lamblia and Giardiasis, Trichomonas and Trichomoniasis, Leishmania and Leishmaniasis, ***B. Helminths;*** Taeniasaginata, Ancylostomaduodenale, Ascaris, enterobiusvermicularis and worm infestation, ***C. Ectoparasites;*** Pediculushumanus and Head lice, Sarcoptesscabei and scabies, Recent molecular techniques. The appropriate preventive and control measures.

Equivalent Course(s) None

Course Name	Islamic Studies/Ethics	**Credit Hours**	**3** (3,0)
Course Code	BPH 2304	**Prerequisite(s)**	None

Course Description

Islamiat: Islamic history, Introduction to Quranic studies, study of selected text of Holy Quran, Seerat of Holy Prophet (S.A.W), Introduction to Sunnah, Selected study of Hadith, Islamic culture & civilization, Islam & Science, Eonomic, Political, and Social System of Islam.

Ethics: This course introduces contemporary and controversial ethical issues facing the scientific community. Topics include moral reasoning, moral dilemmas, law and morality, equity, justice and fairness, ethical standards, and moral development. Upon completion, students should be able to demonstrate an understanding of their moral responsibilities and obligations as members of the workforce and society.

Equivalent Course(s) BTC 1102, ME 1106

Course Name	Epidemiology of Infectious Diseases	**Credit Hours**	**3** (3,0)
Course Code	BPH 3602	**Prerequisite(s)**	BPH 1201, BPH 3506

Course Description

The course topics include;
Disease Spread Through Respiratory Tract, GIT Infections, Vector-Borne Diseases, Zoonotic Diseases, Contagious Diseases, Surface Infections, Sexually Transmitted Infections, Emerging and Re-emerging Diseases.

Equivalent Course(s) None

6.2.2 Bachelor of Science in Public Health (BS-PH)

Course Name	Population Dynamics	**Credit Hours**	**3** (3,0)
Course Code	BPH 3503	**Prerequisite(s)**	None

Course Description

The course topics include;
Introduction to Population dynamics: Various static and dynamic measures of populations, Population and Health: An introduction to Epidemiology, Visit to Federal Bureau of Statistics, Demographic perspective and basic demographic equations, Sources of data including census, Salient features of population pyramids , Concepts and theories of demographic transition , World population growth patterns and population momentum, Mortality & measures of mortality, Global burden of diseases, Fertility, natural increase and reproduction rates, Characteristics of Pakistani population and other countries, Migration and urbanization, Population, Poverty and Politics, Islam and family planning, Population growth and aging, Population Policy.

Equivalent Course(s) None

Course Name	Concept of Health and Disease	**Credit Hours**	**3** (3,0)
Course Code	BPH 3501	**Prerequisite(s)**	None

Course Description

The course topics include;
Concept of health, Dimensions of health, Definition of health, Health spectrum, Determinants of health, Responsibility of health, Indicators of health, Concept of disease, Concept of causation, Levels of prevention, Historical background of public health, Evolution of public health, Definitions of common public health terms, Health for all.

Equivalent Course(s) None

Course Name	Health Promotion, Advocacy and Social Mobilization	**Credit Hours**	**3** (3,0)
Course Code	BPH 3502	**Prerequisite(s)**	None

Course Description

The course topics include;
Concept and Determinants of Health, Health Literacy and Health Communication, Introduction of Health Education, Introduction to Health Promotion, Ottawa Charter, Jakarta, Declaration, Healthy Cities 2000, Advocacy, Community Participation, Enablers and Healthy Public Policy, Approaches to Health Promotion, Cultural, Diversity in Health Promotion, Intervention Programs.

Equivalent Course(s) None

6.2.2 Bachelor of Science in Public Health (BS-PH)

Course Name	Community Pediatrics	**Credit Hours**	**3** (3,0)
Course Code	BPH 3505	**Prerequisite(s)**	None

Course Description	The course topics include; Neonatal Care, Growth Monitoring, Promotion of Breastfeeding, Oral Rehydration, Immunization, Community Feeding, Nutritional Surveillance, Regular Health Check-ups
Equivalent Course(s)	None

Course Name	Fundamental Principles of Infectious Diseases	**Credit Hours**	**3** (3,0)
Course Code	BPH 3506	**Prerequisite(s)**	None

Course Description	The course topics include; Infection, Contamination, Pollution, Infestation, Infectious Disease, Communicable Disease, Contagious Disease, Host, Immune and Susceptible Person, Sporadic, Endemic, Epidemic, Pandemic, Epizootic, Exotic and Zoonotic, Contact, Fomites, Carriers, Vectors and Reservoir of Infection, Incubation, Infective, Prodromal Period and Generation Time, Cross Infection, Nosocomial, Opportunistic Infection and Iatrogenic Disorders, Surveillance, Eradication and Elimination, Reservoir and Source of Infections, Escape of Organism, Mode of Transmission, Entry Into the Body, Susceptible Host and Host Defenses (Immunity), Controlling the Reservoir, Early Diagnosis and Treatment, Isolation, Quarantine, Disinfection Interruption of Transmission.
Equivalent Course(s)	None

Course Name	Non-Communicable Diseases Epidemiology	**Credit Hours**	**3** (3,0)
Course Code	BPH 3604	**Prerequisite(s)**	BPH 1201

Course Description	The course topics include; COPD, Diabetes, Arthritis, IHD/Stroke, Hypertension, Alzheimer, Cancers, Accidents, Suicidal tendencies, Goiter.
Equivalent Course(s)	None

6.2.2 Bachelor of Science in Public Health (BS-PH)

Course Name	Reproductive Health	**Credit Hours**	**3** (3,0)
Course Code	BPH 3605	**Prerequisite(s)**	None

Course Description

The course topics include;
Demography, its tools and vital statistics. Demographic transition and historical forces leading to the current situation. Population pyramid and different profiles of population pyramids, Computation and interpretation of different mortality and morbidity related measures. Compute and interpret different fertility related measures such as Crude Birth Rate, Total Fertility Rate, Age Specific Fertility Rate, Net Reproduction Rate and Doubling Time, Population growth and health issues, Knowledge and understanding of scientific, evidence based approaches to the study of population issues. Causes and consequences of population change and relate these to underlying population dynamics. Knowledge and understanding of demographic behavior in social and policy context.

Equivalent Course(s) None

Course Name	Research Methodology	**Credit Hours**	**3** (3,0)
Course Code	BPH 3606	**Prerequisite(s)**	BPH 1201, BPH 1202

Course Description

The course topics include;
Introduction to Research Methodology, Types of Research, Selection of Research Topic, Formulation of Objectives, Literature Search, Writing Introduction, Plagiarism, Writing Methodology, Data Collection/Questionnaire Design, Analysis and Interpretation, Report Writing, Timeline (Gantt Chart), Budget Plan, Research Ethics.

Equivalent Course(s) BTC 3606

Course Name	Environment and Occupational Health	**Credit Hours**	**3** (3,0)
Course Code	BPH 3601	**Prerequisite(s)**	None

Course Description

The course topics include;
Air Pollution, its Hazards and Prevention, Noise Pollution, its Hazards and Prevention, Water Pollution, its Hazards and Prevention, Water Purification, Radiation, its Hazards and Prevention, Waste Management, Ozone Layer Depletion, Climate Change and Global Warming, Introduction to Occupational Health, Evolution of Occupational Health (Labor Movements), Occupational Health Hazards and its Prevention, Work Place Safety, Prevention of hospital based health hazards in hospital workers, Social Security, Prevention of Gender Harassment.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Public Health (BS-PH)

Course Name	Health Policy and Management	**Credit Hours**	**3** (3,0)
Course Code	BPH 3603	**Prerequisite(s)**	None

Course Description

The course topics include;
Introduction to Health Management, Strategic Management, Planning, Organization, Monitoring, Evaluation, Pakistan Health Policy 2009, Health Financing, Stewardship, History of Health Policy in Pakistan, Determinants of health policy.

Equivalent Course(s) None

Course Name	Health Planning	**Credit Hours**	**3** (3,0)
Course Code	BPH 4703	**Prerequisite(s)**	None

Course Description

The course topics include;
Importance and Significance of Planning, Understanding the Planning Concepts, Planning Models, Types of Plans, Planning Process, Planning Tools, Planning Commission of Pakistan, Role of ECNEC in Planning, Planning for Planning.

Equivalent Course(s) None

Course Name	Health Professional Education	**Credit Hours**	**3** (3,0)
Course Code	BPH 4704	**Prerequisite(s)**	None

Course Description

The course topics include;
Theories of learning and skill development , Student-centered learning, active learning, deep learning, collaborative learning, Conditions of learning: characteristics of powerful learning environments, Using reflective practice to promote learning, Educational principles and theories related to clinical teaching and learning, Identify different approaches to curriculum development and their underlying philosophies, Identify local, national and international drivers which shape curricula in medical education, Design and critique programs (courses) and modules (components of courses) in medical education, Design and critique evaluation strategies and models for programs and modules, Develop assessment strategies, Design assessment tasks appropriate to a range of learning outcomes, Research approaches, methods and techniques in health professions education.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Public Health (BS-PH)

Course Name	District Health Management	**Credit Hours**	**3**(3,0)
Course Code	BPH 4702	**Prerequisite(s)**	None

Course Description

The course topics include;
Introduction to Healthcare Care Delivery System In Pakistan {Public and Private Sector}, Organization of Health Care System in a District, Healthcare Services Delivered at Different Tiers of District Health Management Services. {Minimum Service Delivery Standards}, Health Information System at District Level. Organization and Functioning of Dispensary, MCHC, BHU, RHC, THQ, DHQ. Referral Chain of Patient from BHU to DHQ and onwards, Duties of Different Health Care Providers Employed in District Health Management. Role of District administration in district health management. Nazim and its part in district health management.

Equivalent Course(s) None

Course Name	Mental Health	**Credit Hours**	**3** (3,0)
Course Code	BPH 4805	**Prerequisite(s)**	None

Course Description

The course topics include;
Introduction to Mental Health, Prevention of Mental ill Health and Promote Mental Health, Risk and Protective Factors for Mental Disorders, Socioeconomic Determinants of Mental Health. Mental Health and Quality of Life, Strengthening Community Network, Reducing Harm from Addictive Substances, Prevention of Child Abuse and Neglect, Coping with Parental Mental illness, Management of Mental Health in Rehabilitation Centers.

Equivalent Course(s) None

Course Name	Health Marketing	**Credit Hours**	**3** (3,0)
Course Code	BPH 4803	**Prerequisite(s)**	None

Course Description

The course topics include;
Basic understanding of marketing, Social, societal and health marketing. The History of Marketing in Healthcare, Health care administration and marketing, Strategic marketing, Sale promotion and advertisement, Budgeting and financing, Marketing and the Healthcare Organization, Healthcare Products and Services, Emerging Marketing Techniques, Marketing Research in Healthcare.

Equivalent Course(s) None

6.1.2 Bachelor of Science in Public Health (BS-PH)

Course Name	Entomology	**Credit Hours**	**3** (3,0)
Course Code	BPH 4801	**Prerequisite(s)**	None

Course Description	The course topics include; Common arthropod borne diseases, Classification of Arthropod Vectors, General Characteristics of Arthropods, Mites & Ticks, Insects, Lice Bugs & Fleas, Flies, Mosquitoes, Common Arthropod Borne Diseases, Arthropods of Medical Importance (Mosquito, Flies, Flees, Ticks, Mites and Human Lice), Principles of Arthropods Control (Environmental, Chemical, Biological and Genetics), Insecticides and Their Public Health Importance.
Equivalent Course(s)	None

6.2.2 Master of Science in Biosciences (MS-Biosciences)

Students enrolled in Master of Science in Biosciences (MS-BIO) program are required to complete 8 courses with a minimum of 30 credit hours, within four (4) years to become eligible for obtaining the MS degree in Biosciences. The break-up of 30 courses is as follows:

- *4 Compulsory Courses (12 Credit Hours)*
- *4 Electives[37] (12 Credit Hours)*
- *1 Thesis / 2 additional electives or 2 IRS instead of thesis (6 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
BIO 5101	Advanced Research Methodology	258
BIO 5102	Biostatistics	258
BIO xxx	Elective-I	-
BIO xxx	Elective-II	-
	Spring Semester	
BIO 5201	Molecular Genetics	259
BIO 5202	Techniques in Biomolecules Analyses	259
BIO 5xxx	Elective-III	-
BIO 5xxx	Elective-IV	-
	Second Year	
	Fall Semester	
BIO 5xxx	Thesis / Elective-V OR IRS-I	-
	Spring Semester	
BIO 5xxx	Thesis / Elective-VI OR IRS-II	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

37- List of Electives is given in Appendix B.

6.2.2 Master of Science in Biosciences (MS-Biosciences)

Compulsory Courses

Course Name	Advanced Research Methodology	**Credit Hours**	**3** (3,0)
Course Code	BIO 5101	**Prerequisite(s)**	None

Course Description

The course is aimed to provide a comprehensive description related to research and its methods. Topics include definition and value of research, scientific methods of research and its special features, classification of research, how to select a topic for research? theory and research, concepts, variables and types of variables, hypothesis testing and characteristics, review of literature, conducting a systematic literature review, theoretical framework, problem definition and research proposal, the research process, ethical issues in research, measurement of concepts, criteria for good measurement, research design, tools for data collection, sample and sampling, probability and non-probability sampling, data analysis tools, data presentation, experimental research, use of secondary data, research report writing, and referencing.

Equivalent Course(s) MPH 5205, MS 5239

Course Name	Biostatistics	**Credit Hours**	**3** (2,1)
Course Code	BIO 5102	**Prerequisite(s)**	None

Course Description

The objective of this course is to equip students with current tools and techniques to analyze and interpret data. Topics include the collection, classification, and presentation of descriptive data; the rationale of estimation and hypothesis testing; analysis of variance; analysis of contingency tables; correlation and regression analysis; multiple regression, logistic regression, and the statistical control of confounding; sample size and power considerations; and survival analysis. Special attention is directed to the ability to recognize and interpret statistical procedures in articles from the current literature. This course gives students the skills to perform, present, and interpret basic statistical analyses using the SPSS statistical package.

Equivalent Course(s) MS 5204, MPH 5105, BA 5305

6.2.2 Master of Science in Biosciences (MS-Biosciences)

Course Name	Molecular Genetics	**Credit Hours**	**3** (2,1)
Course Code	BIO 5201	**Prerequisite(s)**	None

Course Description

In this course, students will be introduced to the new and current developments in the field of molecular biology and genetics. Topics include: genome structure and function, chromosomes and chromatin structure, genome organization, genetic and physical mapping, gene regulation, gene and RNA splicing, gene cloning, control of gene regulation, molecular and genetic diagnosis of diseases, genetics of host resistance, gene therapy, human genome project, developmental genetics, cancer genetics, immunogenetics, neurogenetics, and population genetics.

Equivalent Course(s) BTC 5201

Course Name	Techniques in Biomolecules Analyses	**Credit Hours**	**3** (2,1)
Course Code	BIO 5202	**Prerequisite(s)**	None

Course Description

In this course, students are introduced to various tools and techniques that are currently applied for the analyses of biomolecules. Techniques like nuclear magnetic resonance, mass spectrometry, ultraviolet and infrared spectroscopy, genome sequencing and proteome analysis, chromatographic separation of molecules are included in this course. In addition, various visits to high profile research labs will be organized to give proper demonstration and experience to the students.

Equivalent Course(s) BTC 5202

6.2.2 Master of Science in Biotechnology (MS-BIOT)

Students enrolled in Master of Science in Biotechnology (MS-BIOT) program are required to complete 8 courses with a minimum of 30 credit hours, within four (4) years to become eligible for obtaining the MS degree in Biotechnology. The break-up of 30 courses is as follows:

- *4 Compulsory Courses (12 Credit Hours)*
- *4 Electives[38] (12 Credit Hours)*
- *1 Thesis / 2 additional electives or 2 IRS instead of thesis (6 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
BTC 5101	Biostatistics and Laboratory Mathematics	261
BTC 5102	Research Methods in Biotechnology	261
BTC-5xxx	Elective-I	-
BTC-5xxx	Elective-II	-
	Spring Semester	
BTC 5201	Advances in Molecular Genetics	261
BTC 5202	Recent Trends in Molecular Diagnostics	262
BTC 5xxx	Elective-III	-
BTC 5xxx	Elective-IV	-
	Second Year	
	Fall Semester	
BTC 5xxx	Thesis or Elective-V or IRS-I	-
	Spring Semester	
BTC 5xxx	Thesis or Elective-VI or IRS-II	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

38- List of Electives is given in Appendix B.

6.2.2 Master of Science in Biotechnology (MS-BIOT)

Compulsory Courses

Course Name	Research Methods in Biotechnology	**Credit Hours**	**3** (3,0)
Course Code	BIO 5102	**Prerequisite(s)**	None

Course Description

The course is aimed to provide a comprehensive description related to research and its methods. Topics include definition and value of research, scientific methods of research and its special features, classification of research, how to select a topic for research? theory and research, concepts, variables and types of variables, hypothesis testing and characteristics, review of literature, conducting a systematic literature review, theoretical framework, problem definition and research proposal, the research process, ethical issues in research, measurement of concepts, criteria for good measurement, research design, tools for data collection, sample and sampling, probability and non-probability sampling, data analysis tools, data presentation, experimental research, use of secondary data, research report writing, and referencing.

Equivalent Course(s) MPH 5205, BIO 5101, MS 5239

Course Name	Biostatistics and Laboratory Mathematics	**Credit Hours**	**3** (2,1)
Course Code	BTC 5101	**Prerequisite(s)**	None

Course Description

The objective of this course is to equip students with current tools and techniques to analyze and interpret data. Topics include the collection, classification, and presentation of descriptive data; the rationale of estimation and hypothesis testing; analysis of variance; analysis of contingency tables; correlation and regression analysis; multiple regression, logistic regression, and the statistical control of confounding; sample size and power considerations; and survival analysis. Special attention is directed to the ability to recognize and interpret statistical procedures in articles from the current literature. This course gives students the skills to perform, present, and interpret basic statistical analyses using the SPSS statistical package.

Equivalent Course(s) MS 5204, MPH 5105, BIO 5102

Course Name	Advances in Molecular Genetics	**Credit Hours**	**3** (2,1)
Course Code	BTC 5201	**Prerequisite(s)**	None

Course Description

In this course, students will be introduced to the new and current developments in the field of molecular biology and genetics. Topics include: genome structure and function, chromosomes and chromatin structure, genome organization, genetic and physical mapping, gene regulation, gene and RNA splicing, gene cloning, control of gene regulation, molecular and genetic diagnosis of diseases, genetics of host resistance, gene therapy, human genome project, developmental genetics, cancer genetics, immunogenetics, neurogenetics, and population genetics.

Equivalent Course(s) BIO 5201

6.2.2 Master of Science in Biotechnology (MS-BIOT)

Course Name	Recent Trends in Molecular Diagnostics	**Credit Hours**	**3** (2,1)
Course Code	BIO 5202	**Prerequisite(s)**	None

Course Description

In this course, students are introduced to various tools and techniques that are currently applied for the analyses of biomolecules. Techniques like nuclear magnetic resonance, mass spectrometry, ultraviolet and infrared spectroscopy, genome sequencing and proteome analysis, chromatographic separation of molecules are included in this course. In addition, various visits to high profile research labs will be organized to give proper demonstration and experience to the students.

Equivalent Course(s)

BTC 5202

6.2 Masters

6.2.1 Master of Science in Public Health

(MSPH)-36 credits hours

MSPH at SZABIST is a two-year program distributed into two streams i.e., MSPH (36 credit hours) and MSPH (60 credit hours). For MSPH (36 credit hours), the curriculum includes 10 courses of 3 credit hours each and a research project (Thesis) of 6 credit hours or 2 IRS (3 credit hours each) or 2 electives (3 credit hours each). The maximum time limit to complete the MSPH degree is four years. The break-up of credit hours is as follows:

- *7 Core Courses (21 credit hours)*
- *3 Electives[39] (9 credit hours)*
- *1 Thesis (6 Credit Hours) or 2 IRS (3 credit hours each) or 2 electives (3 credit hours each)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
MSP 5104	Social and Behavioral Aspects of Public Health	265
MSP 5101	Basic Epidemiology and Biostatistics	268
MSP 5102	Environmental and Occupational Health	268
MSP 5103	Health Promotion, Advocacy and Social Mobilization	269
	Spring Semester	
MSP 5201	Applied Epidemiology and Biostatistics	270
MSP 5202	Health System	270
MSP 5203	Research Methods: Quantitative and Qualitative	267
MSP 5xxx	Elective-I	-
	Second Year	
	Fall Semester	
MSP 5xxx	Thesis-I or IRS-I	271
MSP 5xxx	Elective-II	-
	Spring Semester	
MSP 5xxx	Thesis-II or IRS-II	271
MSP 5xxx	Elective-III	-

Practicum or One Publication in Peer Reviewed Journal (HEC Indexed Journal).

All courses may not be offered every year. Alternate courses may be substituted as & when needed.

39- List of Electives is given in Appendix B.

6.2 Masters

6.2.1 Master of Public Health (MSPH)

(MSPH)-60 credits hours

For MSPH (60 credit hours), the curriculum includes 18 courses of 3 credit hours each and a research project (Thesis) of 6 credit hours or 2 IRS (3 credit hours each) or 2 electives (3 credit hours each). The maximum time limit to complete the MSPH degree is four years.

The break-up of credit hours is as follows:

- *15 Core Courses (45 credit hours)*
- *3 Elective[40] Courses in the specialized track (9 credit hours)*
- *1 Thesis (6 Credit Hours) or 2 IRS (3 credit hours each) or 2 electives (3 credit hours each)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
MSP 5104	Social and Behavioral Aspects of Public Health	265
MSP 5111	Sociology of Health and Disease	265
MSP 5106	Population Dynamics	265
MSP 5107	Professional Ethics	266
MSP 5105	Mental Health	266
	Spring Semester	
MSP 5206	Microbiology	266
MSP 5204	Entomology	267
MSP 5203	Research Methods: Quantitative and Qualitative	267
MSP 5205	Health Care Risk Management	267
MSP 5207	Parasitology	267
	Second Year	
	Fall Semester	
MSP 5101	Basic Epidemiology and Biostatistics	268
MSP 5102	Environmental and Occupational Health	268
MSP 5103	Health Promotion, Advocacy and Social Mobilization	269
MSP 5202	Health System	270
MSP 5xxx	Thesis-I or IRS-I	271
	Spring Semester	
MSP 5201	Applied Epidemiology and Biostatistics	270
MSP 5xxx	Thesis-II or IRS-II	271
MSP 5xxx	Elective-I	-
MSP 5xxx	Elective-II	-
MSP 5xxx	Elective-III	-

Practicum OR One Publication in Peer Reviewed Journal (HEC Indexed Journal)
All courses may not be offered every year. Alternate courses may be substituted as & when needed.

40- List of Electives is given in Appendix B.

Compulsory Courses

Course Name	Social and Behavioral Aspects of Public Health	**Credit Hours**	**3** (3,0)
Course Code	MSP 5104	**Prerequisite(s)**	None
Course Description	Definition of public health in a historical perspective, Recent developments in public health and future directions of public health, Problem-solving methodology applied to public health, Developing a conceptual framework for understanding the key determinants, Identifying and developing strategies (policies and interventions), Setting priorities and recommending intervention or policies, Implementing interventions or policies and evaluation plan, Developing a communication strategy, Research in public health and importance of evidence-based decision making, Overview of public health programs in Pakistan		
Equivalent Course(s)	MPH 5104		

Course Name	Sociology of Health & Diseases	**Credit Hours**	**3** (3,0)
Course Code	MSP 5111	**Prerequisite(s)**	None
Course Description	Evolution of Health & Healing, Body, Mind, Illness and Environment, Theories, research and debates of medical sociology. Social, environmental and occupational factors in health and illness; The meaning of health and illness from the patient's perspective; The historical transformation of the health professions and the health work force; The social and cultural factors surrounding the creation and labeling of diseases; Disparities in health, access to healthcare, and the quality of healthcare received; Organizational and ethical issues in medicine including rising costs and medical technology; and health care reform.		
Equivalent Course(s)	None		

Course Name	Population Dynamics	**Credit Hours**	**3** (3,0)
Course Code	MSP 5106	**Prerequisite(s)**	None
Course Description	Introduction to language and methods in demography. The demographic transition and historical and modern population trends. Reading: PRB Handbook; Dyson 2001. General relationship linking Mortality and Development. Reading: McKeown; Preston 1975; Johansson & Mosk 1987. The Local Political Economy of Health; and HIV/AIDS Reading: Watkins 2004; Madhaven & Schatz 2007; Swidler and Watkins 2012 [long]. Gender Dimensions of Health and Mortality. Reading: Das Gupta 1987. Fertility Transitions in Poor Countries. Reading: Bongaarts et al. 1990; Pritchett 1994. The Politics of Population Control Reading: Sinding 2000. Migration and Development Reading: Massey 1988; Dyson 2011; Korinek et al. 2005. Technology: Beyond Malthus Reading: Boserup 1965; Johnson and Nurick 1995; McNeil 2006. Population Structures I: Age Structure Dynamics. Reading: Lee and Mason 2006; Eastwood and Lipton 2007. Current Development Initiatives Reading: Lagarde et al. 2007.		
Equivalent Course(s)	MPH 5301		

6.2.1 Master of Public Health (MSPH)

Course Name	Professional Ethics	**Credit Hours**	**3** (3,0)
Course Code	MSP 5107	**Prerequisite(s)**	None

Course Description	It is essential for professionals in any field to have an understanding of the ethical problems and principles in their field. But anyone, no matter what their job, must deal with many other professions as well. Part of professional ethics is the understanding of the professionalism and ethics of other professions: how they interact and what can be expected from them as correct ethical behavior. In turn, any professional will benefit from a critical scrutiny of their own ethics by those from other professions. The general principles of professional ethics will be examined, as well as the distinctive problems of the different fields. The course covers the ethics of several major professions: Business Ethics, Media Ethics, Police Ethics, Medical Ethics, Legal Ethics, and Research Ethics. Topics covered will also include: the nature of a profession, professional codes of ethics, confidentiality, whistle-blowing, the responsibility of business to the environment, uses and abuses of human research, and animal ethics in research.
Equivalent Course(s)	MPH 5307

Course Name	Mental Health	**Credit Hours**	**3** (3,0)
Course Code	MSP 5105	**Prerequisite(s)**	None

Course Description	Introduction to Mental Health, Prevention of Mental ill health and promote mental health, Risk and protective factors for mental disorders, Socioeconomic determinants of Mental health, Mental Health and Quality of life, Strengthening Community Network, Reducing Harm from Addictive Substances, Prevention of Child abuse and neglect, Coping with parental mental illness, Management of mental health in Rehabilitation Centers.
Equivalent Course(s)	MPH 5201

Course Name	Microbiology	**Credit Hours**	**3** (3,0)
Course Code	MSP 5206	**Prerequisite(s)**	None

Course Description	Fundamentals of Microbiology, Introduction to medical Microbiology, Gen. Immunology, Microbial Taxonomy, Gen. Virology, Mycology, Familiarize students with fundamental concept of Microbiology.
Equivalent Course(s)	None

6.2.1 Master of Public Health (MSPH)

Course Name	Entomology	**Credit Hours**	**3** (3,0)
Course Code	MSP 5204	**Prerequisite(s)**	None

Course Description

Common arthropod borne diseases, Arthropods of medical importance (mosquito, flies, flees, ticks, mites and human lice), Principles of arthropods control (environmental, chemical, biological and genetics), Insecticides and their public health importance.

Equivalent Course(s) None

Course Name	Research Methods: Quantitative and Qualitative	**Credit Hours**	**3** (3,0)
Course Code	MSP 5203	**Prerequisite(s)**	None

Course Description

Principles of critical reading of a scientific paper, Definition of research, Importance of research in public health, Selection of topic for research, Literature Search using internet and library, Preparing the background for the proposal writing. Parts of proposal writing. Study design, sampling techniques, inclusion and exclusion criteria. Methodology, Choosing the statistical techniques. Reference writing ,Abstract writing ,Title writing for the proposals.

Equivalent Course(s) MPH 5205, BIO 5101

Course Name	Health Care Risk Management	**Credit Hours**	**3** (3,0)
Course Code	MSP 5205	**Prerequisite(s)**	None

Course Description

The course will provide a historical perspective on the development of health care risk management, the role of the health care risk manager, the principles of health care risk management and the connection between risk management, quality improvement and corporate compliance in various health care settings. Development of a Risk Management Program, The Process of Professional Regulation, Identification of Organizational Risks and Ethics, Risk Financing Insurance

Equivalent Course(s) MPH 5401

Course Name	Parasitology	**Credit Hours**	**3** (3,0)
Course Code	MSP 5207	**Prerequisite(s)**	None

Course Description

Protozoa

Plasmodium and malaria, Entameoba histolytica and dysentery, Giardia lamblia and giardiasis, Trichomonas and trichomoniasis, Leishmania and leishmaniasis.

Helminths

Taeniasaginata, Ancylostoma duodenale, Ascaris, enterobius vermicularis and worm infestation.

Ectoparasites

Pediculus humanus and Head lice, Sarcoptes scabei and scabies.

Equivalent Course(s) MPH 5203

6.2.1 Master of Public Health (MSPH)

Course Name	Basic Epidemiology and Biostatistics	**Credit Hours**	**3** (3,0)
Course Code	MSP 5101	**Prerequisite(s)**	None

Course Description

Definition of Epidemiology, Importance of Epidemiology, Types of study designs: their importance, uses and limitations. Outcome measures for each study design e.g. Relative risk, Odds ratio etc. Causality and association, Inferential Epidemiology, Validity and Reliability, Measuring the Disease burden: Rates, Ratios, Incidence, Prevalence, Role of Chance, Confounding and Bias in interpretations. Screening in disease control Introduction to Biostatistics, Types of statistical applications, Scales of measurements, Descriptive Statistics, Measures of central tendencies, Measures of variability, Measures of shapes, Probability, Probability Distributions: Normal, Poisson, Binomial Sampling techniques, sampling errors/ Confidence Intervals, Concepts of analytical statistics: Hypothesis testing: Alpha and Beta errors Tests of Significance: Normal test, t test, Chi square test etc. Correlation, Regression, Sampling and various sampling techniques, Data presentation: Figures, graphs, tables.

Equivalent Course(s) MPH 5102

Course Name	Environmental and Occupational Health	**Credit Hours**	**3** (3,0)
Course Code	MSP 5102	**Prerequisite(s)**	None

Course Description

Introduction to Environmental Health Issues, Environmental Health Issues of Pakistan, Human Impacts on Environment, Environmental Impacts on Human Health, Sanitation Status and Options in Pakistan, Water Pollution, Drinking Water Quality Situation in Pakistan, Pesticides and Fertilizers, Arsenic, Fluoride and Nitrate contamination in Drinking Waters, Water Born Diseases in Pakistan, Water Supply Agencies, their Capacity and Performance, Present Drinking Water Treatment Practices, Waste Water Availability and its Treatment, Air Pollution, Noise Pollution,, Solid and Hazardous Waste Management Environmental Impact Assessment (EIA), Climate Change and Its Effect on Health, Environment Policy and Law, Workplace and Health, Scope of Occupational Health and Safety, Occupational Health Issues in Low-income Countries, Industrial Hygiene, Anticipation, Recognition, Evaluation, Control, Clinical Occupational and Environmental Medicine, Legal and Regulatory Issues, Labor Law.

Equivalent Course(s) MPH 5101

Course Name	Health Promotion, Advocacy and Social Mobilization	**Credit Hours**	**3** (3,0)
Course Code	MSP 5103	**Prerequisite(s)**	None

Course Description

1. Introduction to Health Promotion and Education
Health promotion, Risk transition, Ottawa Charter, Adelaide, Sundsval, Jakarta and Mexico, Bangkok conferences, Life course perspective, World Health Report 2002.

2. Health perspectives and reflections
Health as a continuum, Approaches to Health Education, Orientations for health education.

3. Evidence-based Health Promotion and Planning
Principles of Health Promotion, Hierarchy of evidence, Outcome model of Health Promotion, A new evidence paradigm, Health A new evidence paradigm.

4. Health Promotion theoretical perspectives
Ecological Models, Community theories, Diffusion of innovations, Community organization theory, Organizational change theory, Interpersonal, Social learning theory, Social cognitive theory, Trans theoretical model / Stages of change model, Health belief model, Consumer information processing Model

5. Models of Health Promotion
Aims of Health Promotion, Towards a more integrated model, Tanahills Model.

6. Models of Health Promotion Planning
Precede-Proceed, Social Marketing, Logic Model.

7. Health Communication
Types and levels, Principles of effective communication, Message, Audience, HEALTHCOMS 5 step methodology, CDC's Health Communication Wheel, "A" frame of advocacy, 7 C's of effective communication, "P" process, Health Communication campaign, Planning a comprehensive health communication campaign.

8. Steps of the comprehensive health communication campaign
Steps of the comprehensive health communication campaign.

9. Social Marketing

10. Evaluating Health Promotion Programs
Stages of research and evaluations for Health Promotion programs, Best practices in health promotion, Skills for evaluation, Steps off evaluation process.

Equivalent Course(s) MPH 5103

6.2.1 Master of Public Health (MSPH)

Course Name	Health System	**Credit Hours**	**3** (3,0)
Course Code	MSP 5202	**Prerequisite(s)**	None

Course Description

Definitions of health input, output and outcomes, Health System: Conceptual Frameworks, Health System: Terms and Concepts, Systems Approach, Micro Health System: Kielmann Model, Health Indicators and their use, Situation Analysis Approach, Instrument for Health Systems Analysis, Macro Health System: WHO model, Health Management Information System, Field Visits for data collection (applied system analysis), Health system functions, Health system outcomes, Primary Health Care Linking the Micro and Macro Health models.

Equivalent Course(s) MPH 5202

Course Name	Applied Epidemiology and Biostatistics	**Credit Hours**	**3** (3,0)
Course Code	MSP 5201	**Prerequisite(s)**	MSP 5101

Course Description

Disease frequency: Incidence and Prevalence, Proportional Morbidity and mortality, Details of measures of association and inference in cohort and case control studies, Further applications of Chance, confounding and bias in studies. Interaction and effect modification. Issues in screening. Survival time analysis. Standardization techniques in epidemiological studies. Parametric test: ANOVA, Non Parametric tests: Chi square test for several proportions, n x k tables and tables with ordered data, Fisher's exact test, non-parametric tests for a single or more than one samples e.g. Wilcoxon's Rank sum tests, Mann-Whitney U-tests. Partial correlation coefficients, coefficient of determination. Multiple regression and Logistic regression.

Equivalent Course(s) None

6.2.1 Master of Public Health (MSPH)

Course Name	Thesis I	**Credit Hours**	**3** (0,3)
Course Code	MSP xxxx	**Prerequisite(s)**	None

Course Description	The course includes introduction to public health systems research is a vital element that the Master of Public Health (MSPH) program at SZABIST boosts. This will conceptualize the research experience and revamp it into a scientific report. This will complete the requirement for the fourth session of MSPH program. By completing their thesis MSPH students will demonstrate their understanding of core competencies through successful application of core knowledge and principles, critical thinking and analytic reasoning skills.
Equivalent Course(s)	MPH 5309

Course Name	Thesis II	**Credit Hours**	**3** (0,3)
Course Code	MSP xxxx	**Prerequisite(s)**	None

Course Description	The course includes introduction to public health systems research is a vital element that the Master of Public Health (MSPH) program at SZABIST boosts. This will conceptualize the research experience and revamp it into a scientific report. This will complete the requirement for the fourth session of MSPH program. By completing their thesis MSPH students will demonstrate their understanding of core competencies through successful application of core knowledge and principles, critical thinking and analytic reasoning skills.
Equivalent Course(s)	MPH 5409

6.2.3 Doctor of Philosophy in Biosciences (Ph.D-BIO)

Students enrolled in Doctor of Philosophy in Biosciences (MS-BIO) program are required to complete 48 credit hours, within eight (8) years to become eligible for obtaining the Ph.D. degree in Biosciences. The break-up of 48 credit hours is as follows:

- *2 Compulsory Courses (6 Credit Hours)*
- *4 Electives[41] (12 Credit Hours) OR 1 IRS (3 Credit Hours) with 3 Electives (9 Credit Hours)*
- *1 Dissertation (30 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
BIO 6101	Statistical Tools for Research	273
BIO 6xxx	Elective-I	-
BIO 6xxx	Elective-II	-
	Spring Semester	
BIO 6201	Research Methodology	273
BIO 6xxx	Elective-III	-
BIO 6xxx	Elective-IV	-
	Second Year	
	Fall Semester	
BIO 6xxx	Dissertation	-
	Spring Semester	
BIO 6xxx	Dissertation	-
	Third Year	
	Fall Semester	
BIO 6xxx	Dissertation	-
	Spring Semester	
BIO 6xxx	Dissertation	-

All courses may not be offered every year. Alternate courses may be substituted as and when needed.

41- List of Electives is given in Appendix B.

6.2.3 Doctor of Philosophy in Biosciences (Ph.D-BIO)

Compulsory Courses

Course Name	Statistical Tools for Research	**Credit Hours**	**3** (3,0)
Course Code	BIO 6101	**Prerequisite(s)**	None

Course Description	In this course, concepts, techniques and applications of quantitative methods for decision making are introduced. The topics include forecasting, regression analysis, analysis of variance, statistical decision theory, utility theory, linear programming, and waiting lines. The course incorporates computer software packages.
Equivalent Course(s)	ELM 6102, SS 6105

Course Name	Research Methodology	**Credit Hours**	**3** (3,0)
Course Code	BIO 6201	**Prerequisite(s)**	None

Course Description	The course covers concept of research, definitions, quantitative and qualitative approaches, proposal for research, identification of research problem, forming hypotheses, critical analysis methods; reading for research; data collection, information gathering; writing literature review, presentation of information, writing academic papers, content and referencing, writing a research proposal and presenting the oral and written research proposals.
Equivalent Course(s)	ELM 6101, SS 6313


International
Programs

8.0 Bachelor

8.1 Bachelor of Arts (Hons) in Business Studies (BABS)

Students enrolled in the BA (Hons) in Business Studies (BABS) program are required to complete 27 courses with 81 Credit Hours. Upon completion of the required courses at SZABIST, students can proceed for the Final Year to the Coventry University. UK to obtain their Bachelor (Honors) degree. If the student wish to continue at SZABIST Karachi, they can obtain BABS degree by completing additional 19 courses and a Research Project. The break-up of the courses offered is given below:

- *46 Compulsory Courses (138 Credit Hours)*
- *1 Research Project (6 Credit Hours)*

Course Code	Course Title	Page #
	First Year	
	Fall Semester	
BA 1101	Introduction to Accounting	277
BA 1102	Microeconomics	277
BA 1103	Introduction to Computers	277
BA 1104	Personal Management	277
BA 1206	Oral Communication and Presentation Skills	278
BA 1204	Math for Business	278
	Spring Semester	
BA 1201	Financial Accounting	278
BA 1202	Macroeconomics	279
BA 1203	Management Principles	279
BA 1105	English Writing Skills	279
BA 2305	Statistics and Mathematics for Business	279
BA 2312	Human Behavior	280
	Summer Semester	
BA 2301	Introduction to Business Finance	280
BA 2302	Graphic Design in Multimedia Presentations	280
	Second Year	
	Fall Semester	
BA 2303	Marketing Principles	280
BA 2304	Managerial Accounting	281
BA 2315	Introduction to Social Sciences	281
BA 2403	Business Ethics	281
BA 3504	Organizational Behavior	281
BA 1207	Introduction to Logic	282
	Spring Semester	
BA 3505	Quantitative Skills	282
BA 3601	Financial Management	282
BA 3602	Marketing Management	283
BA 4704	Management Information Systems	283
BA 4721	Advertising	283
BA 4801	Law and Taxation	283

All courses may not be offered every year. Alternate courses may be substituted as and when required.

8.1 Bachelor of Arts (Hons) in Business Studies (BABS)

All courses may not be offered every year. Alternate courses may be substituted as and when required. Alternate courses may be substituted as and when required. Full – time academic load is six courses (18 credit hours). All students are required to register for full load in the first semester.

Course Name	Introduction to Accounting	**Credit Hours**	**3** (3,0)
Course Code	BA 1101	**Prerequisite(s)**	None
Course Description	This course covers the purpose and nature of accounting, forms of business enterprises, accounting information users, generally accepted accounting principles, accounting equation, accounting process, the accounting cycle, ledgers and entries, accounting for receivables, inventory and depreciation.		
Equivalent Course(s)	AF 1104, EN 1103		

Course Name	Microeconomics	**Credit Hours**	**3** (3,0)
Course Code	BA 1102	**Prerequisite(s)**	None
Course Description	Microeconomics studies how the individual parts of the economy, the households and the firms, make decisions to allocate limited resources. This course is based on a comprehensive study of the market structures, product markets and resource markets. It also deals with application of demand and supply, cost analysis and factors of production.		
Equivalent Course(s)	SS 1105, AF 2405, EN 1205		

Course Name	Introduction to Computers	**Credit Hours**	**3** (1,2)
Course Code	BA 1103	**Prerequisite(s)**	None
Course Description	This course introduces fundamental computer concepts, including basic functions and operations of the computer. Course topics include; identification of hardware, operating system, application software, programming languages, files and data basics, data communication, networking basics, computer graphics, computer security and controls, MS Word, MS Excel, MS Access, MS Power Point, MS Project, internet browsers, databases and e-banking.		
Equivalent Course(s)	BA 1108, BIO 1104, AF 1102, EN 1102, CSC 1104		

Course Name	Personal Management	**Credit Hours**	**3** (3,0)
Course Code	BA 1104	**Prerequisite(s)**	None
Course Description	This course teaches students to discover themselves and make positive changes to achieve greater effectiveness at work, and in personal and interpersonal relationship. Students learn the combination of factors such as personality, communication style, self-esteem, time management, conflict, negotiation and others that impact their personal effectiveness. They also learn methods, and techniques required to work effectively and confidently with others, using time management, negotiation and presentation skills with a positive mindset.		
Equivalent Course(s)	BA 1109, EN 1206		

Course Name	Oral Communication and Presentation Skills	**Credit Hours**	**3** (3,0)
Course Code	BA 1206	**Prerequisite(s)**	None

Course Description

In this course student' learns the principles of a good presentation and has the opportunity to practice and experience these principles during this highly participative course. The course explores in detail, both verbal and non-verbal communication characteristics, and the importance of body-language expressions. Students are challenged through participative exercises with focus on active listening and observation techniques, that aim to make them competent in all facets of effective speech communication.

Equivalent Course(s)

CSC 2101, ME 1101, AF 1203, EN 1106, SS 1116

Course Name	Maths for Business	**Credit Hours**	**3** (3,0)
Course Code	BA 1204	**Prerequisite(s)**	None

Course Description

The aim of this course is to prepare students to solve economic and managerial problem through mathematical concepts. This course is covered in four parts, first part is based on systems of linear equations and its solutions provide preliminary concept, construction of linear equations, graphical interpretation of data, systems of linear equations and solutions, introduction to matrix algebra, determinants, Cramer's rule & inverse method to solve system of linear equations. The second part develops the concept of linear and nonlinear functions and their application, and linear programming. The third part provides mathematics for finance, which covers simple, and compound interest rate computations and present and future annuity calculations. The last part of the course provides differentiation of basic functions, higher order differentiation, optimization of functions, definite and indefinite integration, and applications of integration.

Equivalent Course(s)

BIO 1107, AF 1102, EN 1101

Course Name	Financial Accounting	**Credit Hours**	**3** (3,0)
Course Code	BA 1201	**Prerequisite(s)**	BA 1101

Course Description

This course includes accounting for merchandise business, classified balance sheet, simple and multiple income statement, design of accounting system, accounts receivable, notes receivable, inventories, cost of goods sold, liabilities, corporation and measuring cash flow statements. Also, MS Excel is used and necessary accounting software is introduced.

Equivalent Course(s)

AF 1201

Course Name	Macroeconomics	**Credit Hours**	**3** (3,0)
Course Code	BA 1202	**Prerequisite(s)**	BA 1102

Course Description

This course introduces key economic indicators, role of government in an economy, measurement of gross domestic product, components of aggregate demand, consumption function and Keynesian multiplier, investment function, government intervention through monetary and fiscal policies, impact of government intervention on economic activity, inflation and unemployment, aggregate supply and demand, balance of payments and trade, public finance, growth, and development.

Equivalent Course(s) SS 1205, AF 3505, EN 2303

Course Name	Management Principles	**Credit Hours**	**3** (3,0)
Course Code	BA 1203	**Prerequisite(s)**	None

Course Description

This course introduces the basic concepts of management, evolution and emergence of management thought, management function, planning concepts, decision-making, organizing, staffing, leading, controlling, and future of management and society.

Equivalent Course(s) AF 1106, EN 1204

Course Name	English Writing Skills	**Credit Hours**	**3** (3,0)
Course Code	BA 1105	**Prerequisite(s)**	None

Course Description

This course covers comprehending problems and statements, developing arguments, and communicating ideas clearly and concisely. It also focuses on grammar, forms of punctuation, forms of speech, sentence and paragraph construction, composition, comprehension, writing styles, presentations, verbal communication skills, formal and informal presentations, interactive discussions, and role-playing.

Equivalent Course(s) CSC 1102, MD 1122, SS 2316, BIO 1111, AF 1103

Course Name	Statistics and Mathematics for Business	**Credit Hours**	**3** (3,0)
Course Code	BA 2305	**Prerequisite(s)**	BA 1204

Course Description

The course covers descriptive statistical tools and mathematical methods. Statistical tools consist of: frequency distribution, graphs, charts, mean, and variance, percentiles, correlation, and regression analysis. Mathematical methods consist of matrices, system of linear equations, differentiation and optimization, linear programming, and simplex method. The topics are taught in relation to their application in business and economics.

Equivalent Course(s) BA 2311, BIO 1208, AF 2406, EN 2304, SS 2318

Course Name	Human Behavior	**Credit Hours**	**3** (3,0)
Course Code	BA 2312	**Prerequisite(s)**	None
Course Description	This course covers the basics of psychological features of human behavior with applications in real life situations. In addition, the aspects of personal growth and understanding are also covered.		
Equivalent Course(s)	BA 2306, SS 2306, AF 2303, EN1104		

Course Name	Introduction to Business Finance	**Credit Hours**	**3** (3,0)
Course Code	BA 2301	**Prerequisite(s)**	BA 1201
Course Description	This course covers the concepts of business environment, forms of business organization, overview of financial environment, cost markets, institutions and interest rates, analyses of financial statements, time value of money, sources of short-term and long-term finance, break even analysis, working capital management, valuation of financial securities (debt/equity) and introduction to capital budgeting.		
Equivalent Course(s)	BA 5401, AF 4703, EN 2301		

Course Name	Graphic Design in Multimedia Presentations	**Credit Hours**	**3** (1,2)
Course Code	BA 2302	**Prerequisite(s)**	BA 1103
Course Description	This course introduces the computer system developed for graphics. It covers topics such as hardware and software components for multimedia production, basic computer operations, ergonomics, file management, scanning techniques, archiving capabilities, and utilization of the multimedia department server and internet connection. Software such as Adobe Photoshop, and Freehand are introduced.		
Equivalent Course(s)	BA 4842		

Course Name	Marketing Principles	**Credit Hours**	**3** (3,0)
Course Code	BA 2303	**Prerequisite(s)**	BA 1203
Course Description	This course introduces the basic concepts of marketing, marketing environment, planning and research, market segmentation and targeting, consumer behavior, industrial marketing, product planning, product-mix, pricing, distribution, placement, promotional mix, and marketing in global scenarios.		
Equivalent Course(s)	BA 5404, AF 1206, EN 2305		

Course Name	Managerial Accounting	**Credit Hours**	**3** (3,0)
Course Code	BA 2304	**Prerequisite(s)**	BA 1201

Course Description

This course focuses on cost allocation, process costing systems and spoilage. Specific topics include relevancy of revenues and costs, cost allocation decisions (joint and byproducts), process costing systems, Factory overhead applied, Standard Costing: Setting of Standards, Analysis of Variance and Controlling and Costing Material.

Equivalent Course(s) BA 2408, BA 5411, AF 2302

Course Name	Introduction to Social Sciences	**Credit Hours**	**3** (3,0)
Course Code	BA 2315	**Prerequisite(s)**	None

Course Description

This is an interdisciplinary course combining the perspectives of two or more of the social and behavioral sciences (anthropology, economics, geography, history, political science, psychology and sociology) on the central issues in social science studies. This course explores the relationship between the social and behavioral sciences being studied. It reviews the application of the scientific method, compares theory and concepts, and reviews the different perspectives of the discipline being studied. This course is broad in nature and scope and provides the basis for further study in various social and behavioral sciences.

Equivalent Course(s) BA 2307, SS 2307, AF 2304, EN 1203

Course Name	Business Ethics	**Credit Hours**	**3** (3,0)
Course Code	BA 2403	**Prerequisite(s)**	BA 1203

Course Description

This course introduces contemporary and controversial ethical issues faced by the business community. Topics include: moral reasoning, moral dilemmas, law and morality, equity, justice and fairness, ethical standards, and moral development. Upon completion, students would be able to demonstrate an understanding of their moral responsibilities and obligations as members of the workforce and society.

Equivalent Course(s) AF 3503, EN 2402

Course Name	Organizational Behavior	**Credit Hours**	**3** (3,0)
Course Code	BA 3504	**Prerequisite(s)**	BA 2312

Course Description

This course covers the subject matter on three levels: individual, group and interpersonal, and organizational. At the individual level, the focus is to examine individual behavior and differences, learning, perception, personality, motivation, and stress. The group/ interpersonal level covers group and inter-group behavior, creativity, and team decision-making. It also includes power, conflict, leadership, and communication. At the organizational level, it reviews the basics of organizational culture, organizational change and development, structure, design, employment relationship, and career management.

Equivalent Course(s) BA 5207, AF 2305, EN 2306, SS 2414

Course Name	Introductin to Logic	**Credit Hours**	**3** (3,0)
Course Code	BA 1207	**Prerequisite(s)**	BA 1105

Course Description

This course covers scope and laws of logic, deduction and induction, inferences, forms of discourse, emotive words, kinds of disputes and disagreements, rules and fallacies, classical (Aristotelian) logic, standard-form categorical syllogisms and testing, uniform translation, dilemma and enthymemes, and Mills' Methods of scientific investigation. Critical thinking skills and techniques are also introduced.

Equivalent Course(s) BA 1211, EN 2302

Course Name	Quantitative Skills	**Credit Hours**	**3** (3,0)
Course Code	BA 3505	**Prerequisite(s)**	BA 2305

Course Description

This course is an introduction to quantitative skills essentially required to business students. The course consists of several parts. First is related to arithmetic techniques like: numbers, exponents and roots, ratio and proportion, averages etc. and their usage in solving common problems. The second part consists of algebra, equations, and their applications in solving business problems. The third part comprises of coordinate geometry and combination of above parts. The fourth part covers graphical analysis and interpretation of the data. The fifth and last part consists of data sufficiency problems related to arithmetic, algebra and geometry.

Equivalent Course(s) None

Course Name	Financial Management	**Credit Hours**	**3** (3,0)
Course Code	BA 3601	**Prerequisite(s)**	BA 2301

Course Description

Building upon the concepts already laid down in its pre-requisite, financial management helps students in exploring the depths of the relatively complex aspects of the financial world, with prime focus on the present value and opportunity cost of capital. This course covers topics such as nature, scope, and function of financial decision areas, objectives of financial management, financial forecasting; working capital management, valuation of stocks, valuation of fixed income securities, project cash flow analysis, capital budgeting and decision making, determination of the required rate of return via asset pricing models, dividend policy, debt policy, introduction to financial risk management, and derivatives and role of financial markets in Pakistan.

Equivalent Course(s) BA 5105, AF 4702

Course Name	Marketing Management	**Credit Hours**	**3** (3,0)
Course Code	BA 3602	**Prerequisite(s)**	BA 2303

Course Description

This course introduces the concept of customer and market-driven management. In addition, this course covers organizations' external and internal environment, strengths, weaknesses, opportunities and threats, marketing information system, buyer behavior analysis, segmenting, targeting and positioning strategies, product and pricing strategies, an in-depth study of strategy building by organizations with the help of case studies and a practical, hands-on learning experience of marketing management through close observations of marketing management at different levels in marketing channels.

Equivalent Course(s) BA 5106, AF 2403

Course Name	Management Information Systems	**Credit Hours**	**3** (3,0)
Course Code	BA 4704	**Prerequisite(s)**	BA 1103

Course Description

This course covers different information technology applications in business for efficient management of business operations by providing support to decision makers for strategic business decisions. The course examines various corporate frameworks for information management and their utility.

Equivalent Course(s) AF 2402

Course Name	Advertising	**Credit Hours**	**3** (3,0)
Course Code	BA 4721	**Prerequisite(s)**	BA 2303

Course Description

This course introduces students to the principles and practices of contemporary advertising, marketing and public relations. In this course students explore these roles in the marketplace, the elements of a successful advertisement, advertising production, and tasks accomplished by media professionals while promoting products and service businesses.

Equivalent Course(s) None

Course Name	Law and Taxation	**Credit Hours**	**3** (3,0)
Course Code	BA 4801	**Prerequisite(s)**	BA 1211

Course Description

This course covers process of legislation in Pakistan, Contract Act, Law of Sale of Goods, Partnership Law and Company laws, Sales Tax, Income Tax Law and Intellectual Property Laws. This course identifies the legal rights of persons in case of nonperformance of contracts, it also identifies the taxation system as well as kinds of taxes in Pakistan. Furthermore, it also identifies the intellectual property rights in Pakistan.

Equivalent Course(s) AF 3606, EN 2401

8.2 LLB (University of London) International Program

LLB Honours (University of London)

The University of London – LLB (Honours) requires the students to complete a total of 12 modules (Standard entry route) with a minimum of 36 credit hours.

The following is the break-up of the 12 Modules:

- *9 Compulsory Modules (3 credit hours each)*
- *3 Optional Modules (3 credit hours each)*

In addition, the modules have been listed in order of Level for the convenience of the students.

Description of Modules

Module Name	Criminal Law	**Credit Hours**	**3**
Module Code	LA 1010	**Prerequisite(s)**	None

Module Description

This module examines general principles of criminal liability, a range of fatal and non-fatal offences against the person and selected offences against property. Also, attempts to commit offences, secondary liability and defenses form part of the University of London criminal law curriculum. Criminal law consists of a highly developed body of precisely formulated legal rules, but as criminal conduct is subject to punishment it thus engages with broad issues of morality and policy. Understanding the tension between certainty in the law and social adaptation affects the development of criminal law will take students beyond the basic stage of understanding the substantive rules of criminal law.

Students completing this module are expected to:

1. Describe the legal principles governing liability for offences against the person and property offences;
2. Describe the principles governing criminal defence;
3. Describe the legal principles governing liability for preliminary or inchoate offences and liability as an accomplice;
4. Explain the hierarchy of courts and the appeal process in criminal cases;
5. Explain the points of comparison and distinction between different offences within the same family and different criminal defences.
6. Interpret a set of facts in order to identify legal issues arising, providing reasoned arguments and conclusions as to the criminal offences that may have been committed and defence that may be available;
7. Identify strengths and weaknesses of areas of law in terms of underlying considerations of morality, principle and policy;
8. Communicate in a clear and concise manner, using accurate legal terminology;
9. Conduct straightforward legal research tasks using legal databases and the internet to locate primary and secondary sources relevant to criminal law.

Equivalent Course(s) None

8.2 LLB (University of London) International Program

Module Name	Public Law	**Credit Hours**	**3**
Module Code	LA 1020	**Prerequisite(s)**	None

Module Description

The UK constitution is famously 'unwritten' and thus contrasts with other constitutional models. Analyzing key issues of sovereignty and the division of powers between legislature, executive and administration, one key question is how far the UK lives up to classic doctrine. Equally, membership of the European Union, and the Human Rights Act 1998, affect the overall picture of the relation between citizen and the state. To fully engage with this subject, students need to take an interest in current affairs and debates about what is involved in constitutional issues and reforms.

Students completing this module are expected to:

1. Explain the nature and purpose of constitutions including the ways in which governmental powers are generally allocated among the institutions of the state, and the way in which courts operate to review administrative action and protect basic rights;
2. Describe the main institutions and legal characteristics of the EU and analyze the implications for the UK constitution during membership of the EU 1973 to 2019;
3. Assess the constitutional implications for the UK of the Human Rights Act 1998 and the role of the European Court of Human Rights;
4. Understand the social and political context in which Public law is situated;
5. Evaluate suggestions for constitutional reform in the United Kingdom and the European Union.
6. Conduct straightforward legal research, retrieving information from a range of data sources and including interpretation of textual and numerical data;
7. Distinguish relevant facts and issues presented in a range of legal material;
8. Interpret primary and secondary legal sources, including case law and statutes, to answer questions;
9. Construct a coherent argument in response to oral or written stimuli.

Equivalent Course(s) None

Module Name	Legal System and Methods	**Credit Hours**	**3**
Module Code	LA 1031	**Prerequisite(s)**	None

Module Description

This comprehensive introduction to the English legal system seeks to convey what is distinctive about the common law approach as a legal methodology and as it reflects the history and politics of England and Wales. It examines the sources of law, the civil and criminal court structures, and the role of judges and the jury. A running concern of the course is the question of fairness: the impact of the Human Rights Act on the criminal justice system and the issues of access to justice in the civil courts. This course is also vital in initiating students into the process of legal research and the final examination has a compulsory section on research activities carried out during the year.

Students completing this module are expected to:

1. Understand the structure and operation of the central institutions and processes of the English legal system;
2. Explain the purpose and basic structure of the civil justice system and the place and value of alternative methods of dispute resolution;
3. Explain the purpose and basic structure of the criminal justice system and the tension between the objectives of crime control and protection of civil liberties and human rights;
4. Describe the role and constitutional position of judges and in particular the Law Lords and the Supreme Court;
5. Understand judicial approaches to statutory interpretation and the influence of European law on those approaches;
6. Understand the essential ingredients of the rule of law, and the importance to fairness and justice in social and legal systems.
7. Apply the techniques of legal reasoning covering precedent and statutory interpretation;
8. Identify key issues in a case and summarize points clearly and accurately;
9. Conduct basic legal research tasks using primary and secondary sources;
10. Respond coherently to straightforward questions about the law using legal referencing appropriately;
11. Locate legal sources;
12. Demonstrate understanding of legal terminology;
13. Understand the principles of good academic practice.

Equivalent Course(s) None

Module Name	Contract Law	**Credit Hours**	3
Module Code	LA 1040	**Prerequisite(s)**	None

Module Description

Contracts are the legal basis of all commercial transactions. Covering the core topics – including formation of contracts, capacity to contract and privity, performance and breach of contract and remedies for breach of contract – the emphasis is on understanding the key underlying principles of English law. This is very much a case law subject, with judicial precedents stretching back nearly 400 years in some instances (but more usually of 19th - and 20th - century origin) and a small number of statutory provisions, as well as, the impact of EU law. An understanding of what factors judges may, or must, take into account when exercising their discretion is crucial.

Students completing this module are expected to:

1. Describe the essential elements of a contract and explain how a contract is formed, modified and terminated;
2. Identify and explain appropriate remedies for breach of contractual obligations;
3. Describe the general (economic, social and political) context in which contract law is applied and the current issues affecting contract law;
4. Demonstrate understanding of the development of contract law and discuss its possible future direction(s).
5. Summarize standard legal materials and arguments;
6. Analyze statutes and cases concerned with contract law;
7. Identify issues raised by legal questions and problems and provide reasoned solutions;
8. Carry out straightforward research tasks, using internet-based resources;
9. Reflect on their own learning, responding appropriately to formative testing and feedback.

Equivalent Course(s) None

Module Name	EU Law	**Credit Hours**	**3**
Module Code	LA 2024	**Prerequisite(s)**	None

Module Description

This module presents an overview of the basic features of the EU legal system: the history of European integration; the role of law and the treaty structure; the institutions and court system; the EU's competences and legislative process; the core legal principles of direct effect and supremacy. The module then goes on to focus on areas of substantive law. In particular, it considers the provisions on free movement of goods and workers, and the provisions on the freedom to provide services are thoroughly analyzed with reference to the case law of the European Court of Justice and to relevant secondary legislation. The module also examines the values and policies upon which the European constitutional architecture is founded, touching on issues such as: the protection of the environment; the relationship between trade and human rights; and the tension between market forces and sectors such as public health.

Students completing this module are expected to:

1. Contextualize the modern-day operation of European Union law and the internal market within its historical origins, its treaties and its institutional frameworks;
2. Explain the general principles of EU Law and highlight their relevance in judicial decision-making;
3. Identify the legal sources of the four freedoms and apply relevant statutes and case law to explore the ambit of these freedoms;
4. Understand the concept of abuse of EU law and the regulation of the internal market as related to competition policy;
5. Evaluate how the balance of fundamental rights and the freedoms is achieved as discussed in seminal jurisprudence and wider academic debates.
6. Paraphrase and critique key arguments advanced in judicial opinions and academic writings;
7. Use appropriate legal terminology and abbreviations specific to EU law;
8. Locate and interrogate key primary and secondary sources relevant to EU law.

Equivalent Course(s) None

Module Name	Tort Law	**Credit Hours**	3
Module Code	LA 2001	**Prerequisite(s)**	None

Module Description

The law of tort concerns the civil liability for the wrongful infliction of injury by one person upon another. The characteristic claim in tort is for monetary compensation or damages. There is no single principle of liability, which makes tort law complex; also there are other sources of monetary compensation for personal injuries (such as unemployment / social security payments, private insurance, criminal injuries compensation schemes, etc.) as well as the fact that the same harms may be pursued through the criminal justice system. Negligence is a key topic and other topics include interference with economic interest; trespass; defamation; vicarious liability as well as defenses and remedies, and sources of future development including EU law.

Students completing this module are expected to:

1. Demonstrate a critical awareness of the relationship between policy and principle in common law and legislative provisions in the tort of negligence;
2. Explain the way in which the duty concept is used as a device to control liability for pure economic loss, psychiatric injury and the liability of public bodies;
3. Analyze the legal principles governing liability of occupiers of premises and liability of employers;
4. Analyze the legal principles governing vicarious liability;
5. Explain the law governing trespass to the person and trepass to land;
6. Explain the law of nuisance and the rule in Rylands v Fletcher;
7. Have a developed capacity for effective legal analysis and argument;
8. Have enhanced reasoning skills in relation to moderately complex legal questions and problems.

Equivalent Course(s) None

Module Name	Property Law	**Credit Hours**	**3**
Module Code	LA 3003	**Prerequisite(s)**	

Module Description

Much of the work of solicitors turns around property law in the form of conveyancing (buying and selling dwellings or commercial enterprises) or the relations between landlords and tenants. Here the central principles of English law are portrayed, including the necessary historical context, as many of the basic concepts were established in social conditions very different from today. Property law centers on the concept of the nature and quantum of the various interests that can exist in land, the principles governing the creation, transfer and extinction of these interests and the extent that those interests are enforceable against third parties.

Students completing this module are expected to:

1. Compare and contrast the functions of the rules of common law and statute, and common law and equity;
2. Explain how rights and interests in land are acquired, protected and transferred;
3. Describe and illustrate how property law adapts to social and economic conditions;
4. Identify the moral and ethical questions arising in this area of law.
5. Analyse moderately complex land-related problems by reference to relevant legal authority;
6. Critique standard legal materials and arguments relating to land law, with particular reference to topics of contemporary social and economic significance;
7. Use appropriate legal terminology specific to property law.

Equivalent Course(s) None

8.2 LLB (University of London) International Program

Module Name	Administrative Law	**Credit Hours**	**3**
Module Code	LA 2008	**Prerequisite(s)**	None

Module Description

The module enables students to look in considerably more depth at issues touched upon in only a cursory fashion in public law, namely the traditional grounds of judicial review in both a substantive (illegality and irrationality) and procedural (the principles of natural justice) sense; and the Human Rights Act 1998.The syllabus is also structured to introduce students to such key administrative law concepts as locus standi, the public/private law divide, legitimate expectations, the distinction between void and voidable unlawful decisions, the tortious liability of public authorities, the role of ouster clauses in legislation, and the influence of EU law, Commonwealth and European legal systems on domestic administrative law. A small part of the syllabus aims to acquaint students with other methods used to control the actions of public authorities, primarily by considering the role of ombudsmen and tribunals within the governmental system. The content of the module is also designed to lay consistent emphasis on students developing an enhanced awareness of the ways in which these various micro-level matters fit into broader theoretical issues such as the rule of law, the separation of powers and the sovereignty of parliament.

Students completing this module are expected to:

1. Understand the key principles of judicial review;
2. Explain and offer a critical analysis the relationship between the various grounds of judicial review and process-based issues such as locus standi and the public/private divide;
3. Compare and contrast European (in the sense of EU Law and that under the European Convention on Human Rights and Fundamental Freedoms) law and English law relating to procedural fairness, legitimate expectations, proportionality and fundamental human rights;
4. Explain and offer a critical analysis of non-court-based forms of control of governmental action;
5. Examine how each part of the syllabus impacts upon the broader theoretical context applicable to public law.
6. Evaluate and critique standard legal materials and arguments;
7. Engage in research in primary and secondary materials in order to build an evidence base to support arguments that are put forward;
8. Apply the knowledge acquired in the module to respond to moderately complex legal questions in both essay and problem question form;
9. Construct coherent and accurate responses to self-test questions drawing on subject knowledge.

Equivalent Course(s) None

Module Name	Commercial Law	**Credit Hours**	**3**
Module Code	LA 2017	**Prerequisite(s)**	None

Module Description

The module will provide an understanding of the application of legal principles to particular commercial transactions and the practical issues involved. Commercial law is concerned with obligations between parties to commercial transactions and the relationship with rules of personal property. Emphasis is placed on both knowledge of principles and the ability to apply the rules of law to achieve practical solutions to practical problems. Students will become familiar with a range of issues including ownership of or title to goods; transfers of title and its effect on third parties; passing of property between buyer and seller.

Students completing this module are expected to:

1. Demonstrate a critical understanding of origins and sources of commercial law and the forces that shape commercial law today;
2. Explain the difference between possession and ownership and legal and equitable interests in personal property, the different forms of personal property and the different contracts under which they are transferred including sale, gift, hire- purchase and bailment;
3. Demonstrate a detailed understanding of the nature of a sale of goods and distinguishing features of a business-to-business sale versus a trader-to-consumer sale and how the law has evolved to create these two distinct regimes;
4. Explain the statutory framework within England and Wales governing contracts for the sale of goods between businesses and to consumers with particular regard to the terms implied by the legislation, the passing of property and the nemo dat rule and select the relevant legal principles to synthesise solutions to problems;
5. Analyse the nature of the buyer's and seller's rights under a contract of sale and the remedies available when these contractual rights have been breached and the efficacy of attempts to exempt liability for a breach of such contractual rights;
6. Demonstrate understanding of the legal conception of thebank/ customer relationship and the nature, function and features of bills of exchange;
7. Show understanding of the nature and commercial function of credit, security and the different forms security takes and the mechanisms by which things in action may be transferred by assignment;
8. Understand and critically analyse the consumer credit regime;
9. Demonstrate an understanding of how agency relationships are created, the scope of an agent's authority and the rights and obligations of agents, principals and third parties in relation to each other; analyse instances of agency that arise without the parties' explicit consent.

Equivalent Course(s) None

Module Name	Jurisprudence and Legal Theory	**Credit Hours**	3
Module Code	LA 3005	**Prerequisite(s)**	None

Module Description

The nature of jurisprudence: methodology, analysis, theory and the idea of definition, the relevance of language and ideology. Legal positivism and its critics: the command theory, Hart-Fuller debate, Dworkin's criticism of positivism, Kelsen (including the use of Kelsenian principles in revolution cases), Raz's theory of law. Moral theory and the law: the history of natural law, Finnis's natural law theory, liberalism and the Hart-Devlin debate, moral rights, utilitarianism and its critics, utilitarianism and the economic analysis of law. Legal reasoning: Dworkin's theory of law as integrity, Dworkin's methodology, practical reasoning, Hohfeld's analysis of legal rights. Social theory and critical accounts of law, including the American Critical Legal Studies movement, Marxist theories of law and state, feminist jurisprudence. A study in depth of a text prescribed by the examiners on which there will be one compulsory question in the examination.

Students completing this module are expected to:

1. Have knowledge of some of the most influential legal and political philosophies and their theses on law;
2. Have an understanding of a range of topics and debates in legal and political philosophy and especially the main methodological, ontological and normative questions concerning law and its legitimacy.
3. Construct philosophical argument;
4. Critically assess legal and political theories and question their internal consistency and coherence as well as their foundational assumptions;
5. Apply abstract philosophical argument to real problems and contexts;
6. Present a sustained and well-constructed argument orally and in written form.

Equivalent Course(s) None

Module Name	Equity and Trusts	**Credit Hours**	**3**
Module Code	LA 3002	**Prerequisite(s)**	None

Module Description

A part of Equity law, the law of trusts deals with the rules and principles governing the creation and operation of trusts – a particular method of holding property that developed historically primarily to preserve family wealth, particularly by minimizing liability to taxation. The syllabus focuses on three broad areas:

1) The requirements for establishing a valid trust (including express private trusts; charitable trusts; implied and resulting trusts; constructive trusts);
2 The powers and obligations of trustees under a valid trust (including appointment, retirement and removal of trustees); and
3) The remedies available when trustees act improperly.

Students completing this module are expected to:

1. Contextualise the modern law of trusts within its historical origins and the role of equity in its enforcement;
2. Compare and contrast types of trusts and explain their main distinctive features and purposes;
3. Identify and apply relevant statutory frameworks to the law of Trusts;
4. Explain how breaches of trusts arise and identify and evaluate appropriate remedies;
5. Evaluate key issues in judicial decision making, including ethical and societal considerations, and demonstrate understanding of the wider academic debates.
6. Apply knowledge to complex practical problems and theoretical enquiries demonstrating the ability to think critically about the issues arising;
7. Synthesise key arguments advanced in judicial opinions and academic writings;
8. Distinguish lines of argument and analyse relative strengths and weaknesses;
9. Use appropriate legal terminologies specific to the law of Equity and Trusts.

Equivalent Course(s) None

Module Name	Company Law	**Credit Hours**	**3**
Module Code	LA 3021	**Prerequisite(s)**	None

Module Description

The module aims to introduce students to the nature, and the regulation, of the modern business company. It will enable students to understand what is distinctive about the company, the advantages it enjoys as a way of running a business and the policy issues that its existence raises. Students should learn to understand some of the central concepts relevant to the company, such as limited liability and legal personality, the competing interests of different groups of individuals who are affected by a company's operations, such as its directors, shareholders, creditors and employees, and the role that the law can play in protecting such individuals.

Students completing this module are expected to:

1. Explain the main concepts that underpin company law, including separate legal personality and limited liability;
2. Comprehend the policy issues that arise regarding the regulation of companies, including the views of different commentators about those policy issues;
3. Discuss the main principles and rules that seek to regulate and protect different participants within companies, especially their directors, shareholders and creditors;
4. Summarise the issues that arise in respect of large, widely owned, public companies and the strategies that have been developed to ensure such companies are well governed.
5. Identify the legal issues raised by complex hypothetical 'problem question' scenarios, and apply their knowledge of the main principles and rules of company law to articulate well-argued solutions to those questions;
6. Critically analyse and evaluate selected areas of company law and place the policy issues raised by company law in their social, economic and political contexts;
7. Develop well-reasoned analysis and arguments for the reform of selected areas of company law, including by engaging critically with the arguments of other commentators;
8. Critically read case law and other materials and construct answers to questions set.

Equivalent Course(s) None

Module Name	Introduction to Islamic Law	**Credit Hours**	**3**
Module Code	LA 3028	**Prerequisite(s)**	None

Module Description

The module offers an overview of Islamic law covering its religious historical and contemporary dimensions. The module addresses first the religious and historical foundations of Islamic law before going on to address its application in contemporary jurisdictions. The module aims to give students a basis from which the richness and complexity of Islamic law may be explored further. The module concentrates on various aspects of Islamic law including family law, gifts, wakfs and some other areas of law, such as criminal law, contract and tort.

Students completing this module are expected to:

1. Describe the origins, sources, methods and principles of Islamic law;
2. Describe the history of Islamic law and appreciate its role in the contemporary world;
3. Explain the main features of the administration of Islamic justice including: the role and function of Islamic courts, role of judges, evidence and proof;
4. Compare and contrast the operation of Islamic law in relation to matters concerning crime, contract, tort, family and succession.

Equivalent Course(s) None

8.3 Certificate of Higher Education in Common Law (University of London)

The University of London – Certificate of Higher Education in Common Law requires the students to complete a total of four, level 4, modules (at 3 credit hours each) adding up to a total of 12 credit hours, after which the students have the option of leaving the course with a "Diploma in Common Law" or, if they wish to continue, attain a transfer into the regular LLB (Hons) Program. Moreover, the students are also required to undertake and successfully complete a compulsory English Language course, offered by SZABIST, alongside the 4 modules.

The modules have been listed below for the convenience of the students:

Description of Modules

Module Name	Criminal Law	**Credit Hours**	**3**
Module Code	LA 1010	**Prerequisite(s)**	None

Module Description

This module examines general principles of criminal liability, a range of fatal and non-fatal offences against the person and selected offences against property. Also, attempts to commit offences, secondary liability and defenses form part of the University of London criminal law curriculum. Criminal law consists of a highly developed body of precisely formulated legal rules, but as criminal conduct is subject to punishment it thus engages with broad issues of morality and policy. Understanding the tension between certainty in the law and social adaptation affects, the development of criminal law will take students beyond the basic stage of understanding the substantive rules of criminal law.

Students completing this module are expected to:

1. Describe the legal principles governing liability for offences against the person and property offence;
2. Describe the principles governing criminal defence;
3. Describe the legal principles governing liability for preliminary or inchoate offences and liability as an accomplice;
4. Explain the hierarchy of courts and the appeal process in criminal cases;
5. Explain the points of comparison and distinction between different offences within the same family and different criminal defences.
6. Interpret a set of facts in order to identify legal issues arising, providing reasoned arguments and conclusions as to the criminal offences that may have been committed and defence that may be available;
7. Identify strengths and weaknesses of areas of law in terms of underlying considerations of morality, principle and policy;
8. Communicate in a clear and concise manner, using accurate legal terminology;
9. Conduct straightforward legal research tasks using legal databases and the Internet to locate primary and secondary sources relevant to criminal law.

Equivalent Course(s) None

8.3 Certificate of Higher Education in Common Law (University of London)

Module Name	Public Law	**Credit Hours**	3
Module Code	LA 1020	**Prerequisite(s)**	None

Module Description

The UK constitution is famously 'unwritten' and thus contrasts with other constitutional models. Analyzing key issues of sovereignty and the division of powers between legislature, executive and administration, one key question is how far the UK lives up to classic doctrine. Equally, membership of the European Union, and the Human Rights Act 1998, affect the overall picture of the relation between citizen and the state. To fully engage with this subject, students need to take an interest in current affairs and debates about what is involved in constitutional issues and reforms.

Students completing this module are expected to:

1. Explain the nature and purpose of constitutions including the ways in which governmental powers are generally allocated among the institutions of the state, and the way in which courts operate to review administrative action and protect basic rights;
2. Describe the main institutions and legal characteristics of the EU and analyze the implications for the UK constitution during membership of the EU 1973 to 2019;
3. Assess the constitutional implications for the UK of the Human Rights Act 1998 and the role of the European Court of Human Rights;
4. Understand the social and political context in which Public law is situated;
5. Evaluate suggestions for constitutional reform in the United Kingdom and the European Union.
6. Conduct straightforward legal research, retrieving information from a range of data sources and including interpretation of textual and numerical data;
7. Distinguish relevant facts and issues presented in a range of legal material;
8. Interpret primary and secondary legal sources, including case law and statutes, to answer questions;
9. Construct a coherent argument in response to oral or written stimuli.

Equivalent Course(s) None

8.3 Certificate of Higher Education in Common Law (University of London)

Module Name	Legal System and Methods	**Credit Hours**	3
Module Code	LA 1031	**Prerequisite(s)**	None

Module Description

This comprehensive introduction to the English legal system seeks to convey what is distinctive about the common law approach as a legal methodology and as it reflects the history and politics of England and Wales. It examines the sources of law, the civil and criminal court structures, and the role of judges and the jury. A running concern of the course is the question of fairness: the impact of the Human Rights Act on the criminal justice system and the issues of access to justice in the civil courts. This course is also vital in initiating students into the process of legal research and the final examination has a compulsory section on research activities carried out during the year.

Students completing this module are expected to:

1. Understand the structure and operation of the central institutions and processes of the English legal system;
2. Explain the purpose and basic structure of the civil justice system and the place and value of alternative methods of dispute resolution;
3. Explain the purpose and basic structure of the criminal justice system and the tension between the objectives of crime control and protection of civil liberties and human rights;
4. Describe the role and constitutional position of judges and in particular the Law Lords and the Supreme Court;
5. Understand judicial approaches to statutory interpretation and the influence of European law on those approaches;
6. Understand the essential ingredients of the rule of law, and the importance to fairness and justice in social and legal systems.
7. Apply the techniques of legal reasoning covering precedent and statutory interpretation;
8. Identify key issues in a case and summarize points clearly and accurately;
9. Conduct basic legal research tasks using primary and secondary sources;
10. Respond coherently to straightforward questions about the law using legal referencing appropriately;
11. Locate legal sources;
12. Demonstrate understanding of legal terminology;
13. Understand the principles of good academic practice.

Equivalent Course(s) None

8.3 Certificate of Higher Education in Common Law (University of London)

Module Name	Contract Law	**Credit Hours**	3
Module Code	LA 1040	**Prerequisite(s)**	None

Module Description

Contracts are the legal basis of all commercial transactions. Covering the core topics – including formation of contracts, capacity to contract and privity, performance and breach of contract and remedies for breach of contract – the emphasis is on understanding the key underlying principles of English law. This is very much a case law subject, with judicial precedents stretching back nearly 400 years in some instances (but more usually of 19th - and 20th - century origin) and a small number of statutory provisions, as well as, the impact of EU law. An understanding of what factors judges may, or must, take into account when exercising their discretion is crucial.

Students completing this module are expected to:

1. Describe the essential elements of a contract and explain how a contract is formed, modified and terminated;
2. Identify and explain appropriate remedies for breach of contractual obligations;
3. Describe the general (economic, social and political) context in which contract law is applied and the current issues affecting contract law;
4. Demonstrate understanding of the development of contract law and discuss its possible future direction(s).
5. Summarize standard legal materials and arguments;
6. Analyze statutes and cases concerned with contract law;
7. Identify issues raised by legal questions and problems and provide reasoned solutions;
8. Carry out straightforward research tasks, using internet-based resources;
9. Reflect on their own learning, responding appropriately to formative testing and feedback.

Equivalent Course(s) None

Description of English Language Course

Course Name	English Language Course	**Credit Hours**	**None**
Module Code	None	**Prerequisite(s)**	None

Course Description

The course is designed to improve academic writing skills of students. The course follows a multidimensional approach with a specific focus on reading, writing and critical thinking skills required in an academic environment. The course specifically focuses on enabling the students to experiment with complex grammatical forms, sentence structures, logical paragraph development, presenting coherent, cohesive and effective arguments clearly in academic writing according to the requirements of their specific discipline.

The course aims to facilitate students in the development of academic writing skills. Students will examine various forms of writing required in the academic context. The course will also require students to focus on key elements of critical thinking, writing, and academic presentations.

After successful completion of the course students shall be able to:

1. Apply various reading skills.
2. Comprehend the mechanics of formal language in both verbal and written discourse.
3. Examine the process of paragraph writing.
4. Analyse various forms of academic writing.
5. Construct and present different forms of academic writing.

Equivalent Course(s) None

Appendix

9.0 Appendix A - Optional Courses

9.1 Management Sciences

BACHELOR OF BUSINESS ADMINISTRATION (BBA)

Optional Courses

UNIVERSITY ELECTIVE (To be offered by the campus as Compulsory courses)

BA 3506	Foreign Languages
BA 3519	Current Affairs
BA 3613	World Economy
BA 3614	Business Analysis and Forecasting*
BA 3619	Enterprise Management
BA 4701	Islamic Banking and Finance*
BA 4707	Marketing Research*
BA 3515	Graphic Design for Multimedia*
BA 3621	Professional Development
BA 3521	Auditing
BA 3522	Social Advocacy and Community Service
BA 3622	E-Commerce

Electives will be offered depending on the availability of the resources.
*Can be taken as an Elective if not offered by Campus as a compulsory course.

10.0 Appendix B - Electives

10.1 Management Sciences

BACHELOR OF BUSINESS ADMINISTRATION (BBA)

Elective Courses

Finance

BA 4115	Derivatives
BA 4214	Micro Finance
BA 4218	Financial Research
BA 4735	Islamic Banking and Finance*
BA 4719	Investment Banking
BA 4724	Financial Modeling
BA 4727	Dynamics of Banking
BA 4734	International Banking
BA 4752	Financial Reporting and Analysis
BA 4756	Econometrics
BA 4831	Portfolio and Investment
BA 4833	Management Security Analysis
BA 4834	Treasury and Funds Management
BA 4855	Financial Risk Analysis
BA 4867	Business Analysis and Forecasting*

Marketing

BA 4116	Supply Chain Management
BA 4125	Emerging Media
BA 4126	Trade Marketing
BA 4217	Experiential Marketing
BA 4836	Marketing Research*
BA 4721	Advertising
BA 4722	Brand Management
BA 4739	Export Marketing
BA 4815	Event Management
BA 4816	Industrial Marketing
BA 4821	Media Planning
BA 4824	Sales Management
BA 4842	Graphic Design for Multimedia*
BA 4859	Product Innovation and Design
BA 4866	Integrated Marketing Communications

Supply Chain Management

BA 4116	Supply Chain Management
BA 4126	Trade Marketing
BA 4211	Production Management
BA 4768	Total Quality Management
BA 4739	Export Marketing
BA 4742	Customer Relationship Management
BA 4764	Dynamics of Logistics and Distribution
BA 4824	Sales Management
BA 4844	Operations Research
BA 4859	Product Innovation and Design
BA 4766	Purchase Management

Management

BA 4116	Supply Chain Management
BA 4117	Salary and Compensation
BA 4711	Change Management
BA 4712	Industrial Relations and Labor Laws
BA 4713	Leadership and Motivation Techniques
BA 4812	Recruitment and Selection
BA 4813	Training and Development
BA 4815	Event Management
BA 4826	Talent Management
BA 4837	Performance Appraisal
BA 4844	Operations Research

Information Technology

BA 4224	e-Marketing Strategies
BA 4714	e-Business and e-Commerce Management
BA 4745	Information System Audit
BA 4822	Media Production
BA 4842	Graphic Design for Multimedia*
BA 4844	Operations Research

BS ACCOUNTING AND FINANCE

Elective Courses

Accounting

AF 4722	Advanced Performance Management
AF 4721	Advanced Audit and Assurance
AF 4822	Strategic Business Reporting
AF 4723	Forensic Accounting
Af 4821	Public Sector Accounting

Finance

AF 4725	Analysis of Investment and Management of Portfolios
AF 4825	International Finance
AF 4824	Financing of SME
AF 4823	Financial Risk Analysis
AF 4826	Quantitative Data Analysis
AF 4724	Advanced Financial Management
AF 4727	Dynamics of Banking
AF 4728	Financial Modeling
AF 4726	Behavioral Finance

BS ENTREPRENEURSHIP

Elective Courses

EN 4826	Mergers and Acquisition
EN 4828	Trade and Retail Management
EN 4724	Export Marketing
EN 4824	Intrapreneurship
EN 4721	Agribusiness Management
EN 4725	Family Business Management
EN 4729	Women Entrepreneurship and Leadership
EN 4822	Crisis Management
EN 4726	Managing and Growing a Business
EN 4723	Creativity and Business
EN 4821	Applied Game Theory
EN 4823	Executive Leadership

MASTER OF BUSINESS ADMINISTRATION - MBA

Elective Courses

Finance

BA 5131	Advance Financial Management
BA 5132	Analysis of Financial Statements
BA 5133	Corporate Finance
BA 5134	Derivatives
BA 5135	Financial Markets and Institutions
BA 5138	Econometrics
BA 5139	Financial Risk Analysis
BA 5151	International Finance
BA 5155	Mergers and Acquisitions
BA 5179	Commodity Pricing
BA 5187	Business Analysis and Forecasting
BA 5229	Financial Modeling
BA 5232	Portfolio and Investment Management
BA 5254	Fundamentals of Financial Engineering
BA 5262	Behavioral Finance
BA 5273	Prudential Regulations
BA 5278	Banking Crises and Management
BA 5284	Theory and Practice of Lending
BA 5192	Financial Management Policy
BA 5294	Venture Capital and Private Equity
BA 5298	Financial Reporting and Analysis

Human Resource Management

BA 5114	Leadership and Motivation Techniques
BA 5118	Compensation Management
BA 5117	Performance Appraisal
BA 5159	Salary and Compensation
BA 5164	Human Resources Information Systems
BA 5165	Job Analysis and Design
BA 5167	Talent Management and Succession Planning
BA 5185	Leadership Development
BA 5193	HR Operations and Business Partnering
BA 5196	Conflict Resolution
BA 5215	Recruitment and Selection
BA 5216	Training and Development
BA 5239	HR Policy Development
BA 5251	Human Resource Development
BA 5285	Performance Management
BA 5292	HR Analytics
BA 5297	Human Capital Development and Analytics
BA 5335	Human Resource Audit
BA 5332	Contemporary Issues in Human Resource Management
BA 5435	Human Resource Management and Technology
BA 5452	Psychological Contract in Organizations

Management

BA 5111	Business Process Re-engineering
BA 5112	Change Management
BA 5113	Industrial Management and Labor Relations
BA 5116	Industrial Relations and Labor Laws
BA 5136	Business Strategy and Policy
BA 5152	Event Management
BA 5172	Entrepreneurial Business Strategy
BA 5213	Project Management
BA 5295	Crisis Management
BA 5334	Corporate Sustainability
BA 5242	Lean Six Sigma Manufacturing
BA 5434	Hospitality and Tourism Management
BA 5333	Business Theory
BA 5433	Business Application

MIS

BA 5156	e-Commerce Strategies and Management
BA 5163	Enterprise Resource Planning
BA 5169	Technology Management and Innovation
BA 5181	Business Intelligence and Data Warehousing
BA 5241	e-Commerce

Supply Chain Management (SCM)

BA 5191	Advance Manufacturing and TPM in SCM
BA 5194	Supply Chain Finance
BA 5214	Supply Chain Management
BA 5263	Dynamics of Logistics and Distribution
BA 5265	Operational Planning in Supply Chain
BA 5266	Strategic Procurement in SCM
BA 5287	Execution and Control of Operations in SCM
BA 5291	Detailed Scheduling and Planning in SCM
BA 5142	Materials Management
BA 5338	Shipping in SCM
BA 5432	Green Supply Chain Management
BA 5431	Supply Chain Operations
BA 5449	Strategic Warehouse Management
BA 5439	Green Logistics

Marketing

BA 5121	Advertising
BA 5122	Brand Management
BA 5123	Consumer Behavior
BA 5124	Customer Relationship Management
BA 5126	Export Marketing
BA 5127	Global Marketing
BA 5129	Services Marketing

BA 5171	Strategic Advertising
BA 5182	Trade Marketing
BA 5186	Social Marketing
BA 5199	Integrated Brand Communication
BA 5217	Industrial Marketing
BA 5224	Media Planning and Management
BA 5225	Personal Selling
BA 5226	Pharmaceutical Marketing
BA 5227	Sales Management
BA 5228	Retail Management
BA 5246	Public Relations
BA 5256	Integrated Marketing Communications
BA 5259	Emerging Media
BA 5264	Interactive Global and Regional Marketing
BA 5269	Marketing Intelligence
BA 5281	Digital Marketing
BA 5286	Media Marketing
BA 5293	New Product Development
BA 5296	Process and Innovation Rural Marketing
BA 5198	Experiential and Content Marketing
BA 5299	Media Management
BA 5141	Public Relations Management
BA 5438	Marketing Practices in Pakistan
BA 5331	Marketing Analytics
BA 5339	Packaging for Brands
BA 5337	Retail Strategy and Structure
BA 5437	Retail Supply Chain Management
BA 5436	Retail Operation
BA 5336	Retail Buying and Merchandising
BA 5451	Strategic Entrepreneurship

Banking

BA 5137	International Banking
BA 5175	Banking Operations
BA 5184	Financial Product Regulations
BA 5231	Islamic Banking and Finance
BA 5235	Treasury and Funds Management
BA 5244	Investment Banking
BA 5273	Prudential Regulations
BA 5278	Banking Crises and Management

MASTER IN PROJECT MANAGEMENT (MPM)

Elective Courses

PM 5151	Enterprise Resource Planning
PM 5152	Innovation and Technology Management
PM 5251	Procurement and Contract Management
PM 5252	Project Change Management
PM 5253	Project Human Resource Management
PM 5255	Project Change and Risk Management
PM 5257	Simulation for Project Management
PM 5303	Project Monitoring, Evaluation and Control Management
PM 5352	Project Stakeholders Management
PM 5353	Research Methods for Project Managers
PM 5354	Leadership, Team and Communication for Project Management
PM 5355	Project Communication, Reporting and Presentation
PM 5155	Project Program Portfolio Management
PM 5156	Business Analysis for Project Managers
PM 5259	Construction Project Management
PM 5258	Governance, Monitoring and Evaluation of Development Projects

EXECUTIVE MBA

Elective Courses

Marketing

BE 5321	Services Marketing
BE 5334	Retail Management
BE 5333	Media Planning and Management
BE 5322	Advertising
BE 5323	Brand Management
BE 5324	Consumer Behavior
BE 5325	Customer Relationship Management
BE 5332	Integrated Marketing Communications
BE 5326	Digital Marketing
BE 5327	Emerging Media
BE 5328	Experiential and Content Marketing
BE 5329	Export Marketing
BE 5331	Global Marketing
BE 5335	SAP Sales & Distribution Module

Finance	
BE 5425	International Banking and Finance
BE 5423	Corporate Finance
BE 5426	Islamic Banking and Finance
BE 5421	Analysis of Financial Statements
BE 5427	Portfolio and Investment Management
BE 5428	Project Evaluation
BE 5422	Banking Operations
BE 5424	Financial Modeling
BE 5429	Treasury and Funds Management
BE 5431	SAP Financial Accounting Module
BE 5432	SAP Management Accounting Module
Human Resource Management	
BE 5525	Leadership and Motivational Techniques
BE 5521	Compensation Management
BE 5527	Recruitment and Selection
BE 5526	Performance Appraisal
BE 5531	Training and Development
BE 5522	Conflict Resolution
BE 5523	Crisis Management
BE 5524	HR Analytics
BE 5528	Salary and Compensation
BE 5529	Talent Management and Succession Planning
BE 5532	SAP Human Capital Module
Supply Chain Management	
BE 5631	Supply Chain Management
BE 5623	Dynamics of Logistics and Distribution
BE 5625	Operational Planning in Supply Chain
BE 5627	Strategic Procurement in SCM
BE 5621	Advance Manufacturing and TPM in SCM
BE 5622	Detailed Scheduling and Planning in SCM
BE 5624	Execution and Control of Operations in SCM
BE 5629	Supply Chain Finance
BE 5632	SAP Procurement Module
BE 5633	SAP Production-Planning & Manufacturing Module

MASTER OF SCIENCE IN PROJECT MANAGEMENT (MSPM)

Elective Courses

MP 5102	Project Management Constraints
MP 5201	Quality Management Tools
MP 5205	Theories of Management
MP 5215	Human Resource Management Communication
MP 5217	Financial Decision Analysis
MP 5218	Software Project Management
MP 5314	Project Review, Assurance and Governance
MP 5317	Supply Chain Management
MP 5318	Business Analysis
MP 5324	Risk Management Dynamics
MP 5325	Project Simulation
MP 5224	Project Scope
MP 5223	Project Scheduling, Planning and Time Management
MP 5328	Project Risk Management
MP 5226	Governance, Monitoring and Evaluation of Development Projects

Elective courses may vary from time to time. All courses may not necessarily be offered every year. Alternate courses may be substituted as and when required.

Students cannot register in Independent Research Study (IRS) or Thesis without completion of Research Methodology and Quantitative Tools for Research.

Maximum course load for a semester is 4 courses (12 credit hours). Summer is not a regular semester; therefore, courses are not offered on a regular basis in summer.

MASTER OF SCIENCE IN MANAGEMENT SCIENCES (MSMS)

Elective Courses

Finance

MS 5113	Financial Time Series
MS 5103	Managerial Economics
MS 5105	Econometrics
MS 5111	Derivatives and Financial Risk
MS 5115	Operations and Mathematical Modeling
MS 5134	Behavioral Finance
MS 5206	Modern Financial Applications
MS 5215	Corporate Finance
MS 5217	Corporate Finance Planning and Decisions
MS 5218	Financial Markets
MS 5237	Business Finance and Decision Making
MS 5414	Applied Econometrics
MS 5421	Capital Asset Pricing Model
MS 5425	Empirical Asset Pricing
MS 5317	Seminars in Finance
MS 5426	Mathematical Modeling in Finance
MS 5412	Islamic Banking and Finance

Marketing

MS 5249	Advanced Marketing Strategies
MS 5301	Seminars in Marketing
MS 5422	Distribution and Channel Management
MS 5424	Strategic Brand Management
MS 5429	Marketing Metrics
MS 5431	Strategic Entrepreneurial Marketing
MS 5432	Strategic Social Marketing
MS 5428	Global Marketing Strategies
MS 5433	Advertising Research
MS 5434	Behavioral Marketing

Human Resource Management

MS 5101	Change Management
MS 5102	Organizational Development
MS 5202	Organizational Strategies and Effectiveness
MS 5203	Global Corporate Strategy
MS 5205	International Business Management
MS 5211	Creative Leadership
MS 5216	Corporate Governance
MS 5225	Leadership and Motivation Techniques
MS 5229	Negotiations and Conflict Resolution
MS 5241	Public Administration and Governance
MS 5245	System Thinking and Organizational Learning
MS 5303	Issues in Strategic Management
MS 5415	NGO Management
MS 5423	Global Governance and Development
MS 5427	Seminars in HRM

Elective courses may vary from time to time. All courses may not necessarily be offered every year. Alternate courses may be substituted as and when required.

Students cannot register in Independent Research Study (IRS) OR thesis without completing six compulsory courses.

Maximum course load for a semester is 4 courses (12 credit hours). Summer is not a regular semester; therefore, courses are not offered on a regular basis in summer. A student can take maximum two interdisciplinary elective courses in SS/CS/IT/Media/MBA program with the prior approval of respective program managers.

DOCTOR OF PHILOSOPHY IN MANAGEMENT SCIENCES (PhD-MS)

Elective Courses

Finance

MS 6111	Business Finance and Decision Making
MS 6113	Applied Econometrics
MS 6202	Econometrics
MS 6315	Capital Asset Pricing Model
MS 6317	Empirical Asset Pricing
MS 6318	Financial Markets
MS 6319	Modern Financial Applications
MS 6322	Behavioral Finance
MS 6323	Corporate Finance
MS 6411	Financial Time Series
MS 6418	Operations and Mathematical Modeling
MS 6421	Corporate Finance Planning and Decision
MS 6422	Derivatives and Financial Risk
MS 6423	Managerial Economics
MS 6325	Seminars in Finance
MS 6425	Strategic Finance
MS 6434	Mathematical Modeling in Finance
MS 6429	Islamic Banking and Finance

Marketing

MS 6204	Strategic Marketing Decisions
MS 6215	Seminars in Marketing
MS 6312	Advanced Marketing Strategy
MS 6316	Distribution and Channel Management
MS 6415	Strategic Brand Management
MS 6431	Marketing Metrics
MS 6432	Strategic Entrepreneurial Marketing
MS 6433	Strategic Social Marketing
MS 6428	Global Marketing Strategies
MS 6326	Advertising Research
MS 6435	Behavioral Marketing

Human Resource Management

MS 6112	Strategic Human Resource Development
MS 6114	NGO Management
MS 6201	Change Management
MS 6205	Public Administration and Governance
MS 6211	Organizational Development
MS 6311	Corporate Governance
MS 6314	Global Corporate Strategy
MS 6321	Organizational Strategies and Effectiveness
MS 6324	Issues in Strategic Management
MS 6412	Creative Leadership
MS 6413	International Business Management
MS 6414	Global Governance and Development
MS 6416	Negotiations and Conflict Resolution
MS 6417	Leadership and Motivation Techniques
MS 6419	System Thinking and Organizational Learning
MS 6424	Strategic Management
MS 6426	Seminars in HRM
MS 6427	Applied Strategic Management

10.0 Appendix B - Electives

10.2 Computer Science

BACHELORS OF SCIENCE IN COMPUTER SCIENCES (BSCS)

CS ELECTIVES

CSC 4802	Android Application Development
CSC 4703	Applied Data Mining
CSC 4803	Auditing Information Systems
CSC 4804	Business Process Re-engineering
CSC 4705	Control Systems
CSC 4805	Data and Network Security
CSC 4504	Organizational Behavior
CSC 4604	Research Report
CSC 4505	Systems Administration
CSC 4807	Embedded Programming
CSC 4708	Enterprise Resource Planning
CSC 4808	Ethical Hacking
CSC 4709	Internet Business Models
CSC 4809	iOS Development
CSC 4712	IT Innovations
CSC 4713	Managing Data-Center Projects
CSC 4812	Mechatronics
CSC 4813	Modeling and Simulation
CSC 4714	Network Security and Encryption
CSC 4815	Software Engineering-II
CSC 4814	Software Project Management
CSC 4716	Switching and Routing
CSC 4816	Technopreneurship
CSC 4717	Web Technologies-I
CSC 4817	Web Technologies-II
CSC 4718	Wireless and Mobile Technologies
CSC 4823	Interaction Design
CSC 4719	Game Development
CSC 4721	Introduction to Cloud Computing
CSC 4822	Software Engineering Economics
CSC 4818	Data Sciences
CSC 4824	Embedded Systems
CSC 4825	Computer Graphics

Coverage of relevant pre-requisite will be ensured while allowing any of the aforementioned courses from this category

BACHELORS OF SCIENCE IN COMPUTER SCIENCE (BSCS)

University Electives

Each campus may offer university electives as per convenience and availability of resources. The Electives being offered at Karachi Campus as are as follows::

CSC 4501	Business and Technology Ethics
CSC 4606	Psychology
CSC 4605	Sociology
CSC 4601	Foreign Languages
CSC 4502	Design and Creativity
CSC 4602	History of Scientific Ideas
CSC 4503	Introduction to Accounting
CSC 4603	Management Principles
CSC 4504	Organizational Behavior
CSC 4604	Research Report
CSC 4505	Systems Administration

BACHELORS OF SCIENCE ARTIFICIAL INTELLIGENCE (BSAI)

BSAI - ELECTIVES

AIC 4701	Advanced Statistics
AIC 4706	Theory of Automata and Formal Languages
AIC 4802	Data Mining
AIC 4702	Deep Learning
AIC 4805	Speech Processing
AIC 4804	Reinforcements Learning
AIC 4803	Fuzzy Systems
AIC 4703	Evolutionary Computing
AIC 4705	Swarm Intelligence
AIC 4801	Agent Based Modeling
AIC 4704	Knowledge Based Systems

BACHELORS OF SCIENCE ARTIFICIAL INTELLIGENCE (BSAI)

BSAI - University Electives	
AIC 4504	Organizational Behavior
AIC 4605	Research Report
AIC 4603	Management Principles
AIC 4601	Business and Technology Ethics
AIC 4503	Introduction to Accounting
AIC 4602	Foreign Languages
AIC 4502	History of Scientific Ideas
AIC 4501	Design and Creativity
AIC 4505	Sociology
AIC 4604	Psychology
AIC 4504	Organizational Behavior

Master of Science in Data Sciences (MSDS)

University Electives	
DSC 5221	Advanced Computer Vision
DSC 5125	Algorithmic trading
DSC 5224	Bayesian Data Analysis
DSC 5242	Big Data Analytics
DSC 5126	Bioinformatics
DSC 5121	Cloud computing
DSC 5225	Computational Genomics
DSC 5122	Data Visualization
DSC 5223	Deep Learning
DSC 5226	Deep Reinforcement Learning
DSC 5127	Distributed Data Processing and Machine Learning
DSC 5227	Distributed Machine Learning in Apache Spark
DSC 5228	High performance computing
DSC 5128	Inference & Representation
DSC 5241	Natural Language Processing
DSC 5129	Optimization Methods for Data Science and Machine Learning
DSC 5229	Probabilistic Graphical Models
DSC 5231	Scientific Computing in Finance
DSC 5131	Social network analysis
DSC 5132	Time series Analysis and Prediction

MASTER OF SCIENCE IN COMPUTER SCIENCES (MSCS)

Elective Courses

CS-Stream

CSC 5164	Real-Time Systems
CSC 5162	Digital Image Processing
CSC 5161	Machine Learning
CSC 5163	Data Mining
CSC 5166	Operation Research
CSC 5264	Expert Systems
CSC 5267	Reverse Engineering
CSC 5266	Digital Forensics and Malware Analysis
CSC 5263	Advanced Resource Sharing Architecture
CSC 5262	Computer Vision
CSC 5268	Robotics
CSC 5261	Advanced Database Design
CSC 5265	Distributed Computing
CSC 5269	Systems and Network Programming
CSC 5168	Big Data Analytics
CSC 5271	Natural Language Processing
CSC 5167	Deep Learning

SE-Stream

SEC 5163	Software Requirement Engineering
SEC 5161	Software System Architecture
SEC 5164	Software System Quality
SEC 5162	Advanced Software Engineering
SEC 5261	Software Analysis and Testing
SEC 5263	Web Engineering
SEC 5262	Software Project Management

N&S-Stream

NSC 5161	Advanced Computer Networks
NSC 5163	Network Security
NSC 5164	Applied Cryptography
NSC 5162	Information Security
NSC 5261	Wireless Sensor Networks
NSC 5264	Telecom Policies and Regulations
NSC 5263	Mobile Ad-hoc Networks
NSC 5262	Advanced Data Communications
NSC 5165	Cyber Security
NSC 5265	Advanced Routing and Switching
NSC 5166	Advanced Ethical Hacking

DOCTOR OF PHILOSOPHY IN COMPUTER SCIENCES (PhD CS)

Elective Courses

CSC 4802 Android Application Development
CSC 4703 Applied Data Mining
CSC 4803 Auditing Information Systems
CSC 4804 Business Process Re-engineering
CSC 4705 Control Systems
CSC 4805 Data and Network Security
CSC 4504 Organizational Behavior
CSC 4604 Research Report
CSC 4505 Systems Administration
CSC 4807 Embedded Programming
CSC 4708 Enterprise Resource Planning
CSC 4808 Ethical Hacking
CSC 4709 Internet Business Models
CSC 4809 iOS Development
CSC 4712 IT Innovations
CSC 4713 Managing Data-Center Projects
CSC 4812 Mechatronics
CSC 4813 Modeling and Simulation
CSC 4714 Network Security and Encryption
CSC 4815 Software Engineering-II
CSC 4814 Software Project Management
CSC 4716 Switching and Routing
CSC 4816 Technopreneurship
CSC 4717 Web Technologies-I
CSC 4817 Web Technologies-II
CSC 4718 Wireless and Mobile Technologies
CSC 4823 Interaction Design
CSC 4719 Game Development
CSC 4721 Introduction to Cloud Computing
CSC 4818x Software Engineering Economics
CSC 4818 Data Sciences
CSC xxxx Embedded Systems
CSC xxxx Computer Graphics

University Electives

Each campus may offer university electives as per convenience and availability of resources. The Electives being offered at Karachi Campus as are as follows:

CSC 4501 Business and Technology Ethics
CSC 4606 Psychology
CSC 4605 Sociology
CSC 4601 Foreign Languages
CSC 4502 Design and Creativity
CSC 4602 History of Scientific Ideas
CSC 4503 Introduction to Accounting
CSC 4603 Management Principles
CSC 4504 Organizational Behavior
CSC 4604 Research Report
CSC 4505 Systems Administration

10.0 Appendix B - Electives

10.3 Mechatronics Engineering

BACHELOR OF ENGINEERING IN MECHATRONICS ENGINEERING (BEME)

Elective Courses

Engineering Electives

ME4722	Digital Signal Processing
ME4828	Modeling and Simulation
ME4821	Digital Image Processing
ME4727	Digital Control Systems
ME4826	Embedded Systems
ME4721	Artificial Intelligence and Computer Vision
ME4827	Applied Thermodynamics
ME4704	Mechanical Vibrations

Management Science Electives

ME4823	Engineering Management
ME4728	Total Quality Management
ME4725	Leadership and Motivation Techniques

Social Science Electives

ME2352	Organizational Behavior
ME2353	Psychology
ME2354	Sociology
ME2351	Foreign Languages

All courses may not be necessarily being offered every year. Alternate courses may be substituted as and when needed.

MASTERS OF SCIENCE IN MECHATRONICS ENGINEERING (MSME)

Elective Courses

Robotics and Industrial automation

ME 5225	Mobile Robotics
ME 5222	Cognitive Robotics
ME 5324	Machine Vision
ME 5321	Advanced Manufacturing Design Techniques
ME 5221	Adaptive Control
ME 5326	Precision Manufacturing Systems
ME 5325	Optimization of Engineering Systems
ME 5322	Computer Integrated Manufacturing
ME 5224	Micro-Manufacturing Systems and Technology
ME 5226	Rapid Prototyping, Tooling and Automation
ME 5223	Linear Control Systems
ME 5323	Industrial Control Technology

Smart Electromechanical Systems

ME 5329	Micro-Electro Mechanical Systems
ME 5227	Advanced Modeling and Simulation
ME 5331	Programming of Embedded Systems
ME 5228	Linear Control Systems
ME 5327	Artificial Intelligence
ME 5332	Sensor and Sensing Technology
ME 5229	Optomechatronic Systems
ME 5232	Smart Materials and Structures
ME 5231	Pattern Recognition and Analysis
ME 5328	Digital Integrated Circuit Design

All courses may not be necessarily being offered every year. Alternate courses may be substituted as and when needed.

10.0 Appendix B - Electives

10.4 Social Sciences

BACHELOR OF SCIENCE IN SOCIAL SCIENCES (BSSS)

Elective Courses

SS 1154	Literature
SS 2305	Human Geography
SS 1157	Comparative Religion
SS 1254	World History
SS 1262	Mass Media
SS 1163	Development and Politics
SS 1263	Culture and Media in Sindh
SS 1164	History of Ideas

Psychology

SS 4111	Abnormal Psychology
SS 4112	Developmental Psychology
SS 4134	Cognitive Psychology
SS 4135	Educational Psychology
SS 4234	Psychodynamics
SS 4268	History of Psychology
SS 4167	Child Psychology
SS 4156	Clinical Psychology
SS 4114	Personality Theories
SS 4255	Counseling and Psychotherapy
SS 4211	Psychological Testing
SS 4236	Positive Psychology
SS 4168	Experimental Psychology
SS 4267	Forensic Psychology
SS 426	Physiological Psychology

Sociology

SS 4269	Civil Society
SS 4271	Peace Movements
SS 4138	Corporate Social Responsibility
SS 4141	Mass, Media and Society
SS 4237	Post-Colonial State and Social Development
SS 4238	Social Entrepreneurship
SS 4239	Social Justice
SS 4241	Sociology of Education
SS 4242	The Sociology of Poverty
SS 4196	Social Theories-I
SS 4296	Social Theories-II
SS 4171	Class, Caste, and Ethnicity in South Asia
SS 4172	Political Sociology
SS 4272	Social Change in Pakistan
SS 4169	Citizenship
SS 4273	Urbanization
SS 4295	Criminology
SS 4197	The Sociology of Religion

International Relations

SS 4275	Foreign Policy and International Politics
SS 4274	Diplomacy, Conflict Resolution and Confidence Building Measures
SS 4219	Peace Research
SS 4222	Strategic Studies
SS 4176	Globalization and Global Governance
SS 4277	Modern Ideologies
SS 4174	Central and West Asian Studies
SS 4175	European Studies
SS 4177	Middle Eastern Studies
SS 4179	Politics of Terrorism
SS 4178	Muslim World
SS 4276	International Institutions
SS 4278	Political Geography
SS 4119	Arms Control and Disarmament
SS 4279	US and International Politics

Sindh Studies

SS 4188	Geography and Geology of Sindh
SS 4287	History and Politics of Sindh
SS 4288	Irrigation System of Sindh
SS 4185	Agriculture in Sindh
SS 4285	Archaeology of Sindh
SS 4186	Anthropology and Culture of Sindh
SS 4286	Art and Architecture in Sindh
SS 4187	Ethnomusicology of Sindh
SS 4289	Sindh's Economy and Commerce
SS 4292	Survey of Sindhi Literature
SS 4189	Philosophy of Sindh
SS 4192	Sindh's Sociology-I: Education and Language Policy
SS 4193	Sindh's Sociology-II: Social Structures and Development
SS 4194	Sindh's Sociology-III: Health, Gender, and Feminism
SS 4293	he Sindhi Diaspora
SS 4291	Sindh's Geopolitical Exigencies
SS 4191	Sindh's Botanical and Zoological Heritage

Economics

SS 4139	Gender and Development
SS 4147	Development and Planning
SS 4181	Capabilities and Human Development
SS 4281	Fiscal and Monetary Economics
SS 4261	Mathematical Economics
SS 4183	Industrial Economics
SS 4284	Trade Economics
SS 4128	Agriculture Economics
SS 4182	Game Theory
SS 4283	Labour Economics
SS 4282	Growth
SS 4184	Poverty and Inequality
SS 4228	History of Economic Thoughts
SS 4249	Pakistan Economy
SS 4251	Sustainable Development

MASTER OF SCIENCE IN SOCIAL SCIENCE (MSSS)

Elective Courses

* Electives (Electives in any of the following specializations)
- International Relations
- Economics
- Psychology
- Sociology

MS (International Relations)

SS 5431	Dynamics of Security
SS 5439	Globalization in the 21st Century: Challenges and Opportunities
SS 5436	Role of Great Powers and International Relations
SS 5437	Critical Geo-Politics
SS 5104	Politics of Geo-Economics
SS 5111	Democratization as a Global Process
SS 5212	NGO Management
SS 5306	Sacred and Secular
SS 5311	Environmental Studies
SS 5312	Globalization and Developing Countries
SS 5313	Intellectual Property Rights and Laws
SS 5321	History of Ideas
SS 5206	Political Economy in the Global Perspective
SS 5402	Law and Human Rights
SS 4431	Globalization: Issues and Debates
SS 5434	Political Theory
SS 5442	History of Economic Thought in Contemporary Perspective
SS 5438	Foreign Policy of Pakistan

MS (Economics)

SS 5234	International Trade
SS 5236	Economic Growth and Development
SS 5238	Monetary Economics
SS 5203	Public Finance
SS 5439	Globalization in the 21st Century: Challenges and Opportunities
SS 5223	Financial Time Series
SS 5104	Politics of Geo-Economics
SS 5305	Political Economy of Pakistan
SS 5214	Public Policy Management
SS 5322	Topics in Political Economy
SS 5206	Political Economy in the Global Perspective
SS 5327	Development Economics and Sustainability
SS 5312	Globalization and Developing Countries
SS 5321	History of Ideas
SS 5228	Corporate Governance
SS 5231	Advanced Microeconomics
SS 5232	Advanced Macroeconomics
SS 5233	Advanced Econometrics
SS 5442	History of Economic Thought in Contemporary Perspective
SS 5235	Gender Work and Economy
SS 5432	Gender issues in Rural Development

MS (Sociology)

SS 5332	Sociology of Development
SS 5345	Population Dynamics
SS 5348	Social Statistics
SS 5217	Cultural Anthropology
SS 5212	NGO Management
SS 5331	Gender and Human Rights
SS 5402	Law and Human Rights
SS 5336	Community Development and Social Mobilization
SS 5339	Gender Issues in Global Scenario
SS 5333	Sociology of Gender Issues
SS 5352	Women Studies
SS 5306	Sacred and Secular
SS 5351	Sociology of Sexuality
SS 5441	Globalization: Issues and Debates
SS 5215	Global Governance
SS 5349	Sociology of Science, Knowledge and Technology
SS 5342	Industrial Sociology
SS 5341	Immigration in Contemporary Perspectives
SS 5335	Sociology of Migration and Urbanization
SS 5302	Sustainable Development
SS 5334	Social Change and Development
SS 5347	Rethinking Global Development: New Frameworks for Understanding Poverty, Inequality and Growth in 21 Century
SS 5337	Community Organizing and Development
SS 5346	Religion and Development
SS 5344	Population and Development: Current Issues and Future Implications
SS 5338	Contemporary Sociological Thoughts
SS 5343	Leadership in Sociology: Theory and Practice

MS (Psychology)

SS 5461	Applications of Contemporary Data Analysis Tools
SS 5435	Use, Construction and Interpretation of Tests
SS 5423	School Psychology
SS 5422	Cross-Cultural Psychology
SS 5463	Community Psychology
SS 5465	Environmental Psychology
SS 5433	Gender Psychology
SS 5464	Consumer Behavior
SS 5421	Perspective in Organizational Psychology
SS 5469	Psychological Assessment in Organizational Psychology
SS 5471	Psychology of Leadership
SS 5468	Organizational Culture and Development
SS 5466	Marketing and Consumer Psychology
SS 5467	Organizational Conflict and Management
SS 5328	Assessment and Diagnosis-I
SS 5411	Assessment and Diagnosis-II
SS 5319	Psychotherapy and Counseling-I
SS 5419	Psychotherapy and Counseling-II
SS 5329	Psychophysiology and Psychopharmacology

DOCTOR OF PHILOSOPHY IN SOCIAL SCIENCES (PhD)

Elective Courses

PhD (International Relations)

SS 6225	Dynamics of Security
SS 6229	Globalization in the 21st Century: Challenges and Opportunities
SS 6331	Role of Great Powers and International Relations
SS 6223	Critical Geo-Politics
SS 6104	Politics of Geo-Economics
SS 6111	Democratization as a Global Process
SS 6212	NGO Management
SS 6306	Sacred and Secular
SS 6311	Environmental Studies
SS 6312	Globalization and Developing Countries
SS 6313	Intellectual Property Rights and Laws
SS 6227	Foreign Policy of Pakistan
SS 6321	History of Ideas
SS 6206	Political Economy in the Global Perspective
SS 6402	Law and Human Rights
SS 6231	Globalization: Issues and Debates
SS 6236	Political Theory
SS 6232	History of Economic Thought in Contemporary Perspective

PhD (Economics)

SS 6324	International Trade
SS 6327	Economic Growth and Development
SS 6332	Monetary Economics
SS 6322	Public Finance
SS 6229	Globalization in the 21st Century: Challenges and Opportunities
SS 6223	Financial Time Series
SS 6104	Politics of Geo-Economics
SS 6305	Political Economy of Pakistan
SS 6214	Public Policy Management
SS 6322	Topics in Political Economy
SS 6206	Political Economy in the Global Perspective
SS 6327	Development Economics and Sustainability
SS 6232	History of Economic Thought in Contemporary Perspective
SS 6312	Globalization and Developing Countries
SS 6321	History of Ideas
SS 6228	Corporate Governance
SS 6325	Advanced Microeconomics
SS 6321	Advanced Macroeconomics
SS 6323	Advanced Econometrics
SS 6329	Gender Work and Economy
SS 6336	Advanced Labour Economics

PhD (Sociology)

SS 6367	Sociology of Development
SS 6363	Population Dynamics
SS 6366	Social Statistics
SS 6315	Cultural Anthropology

SS 6212	NGO Management
SS 6355	Gender and Human Rights
SS 6402	Law and Human Rights
SS 6353	Community Development and Social Mobilization
SS 6356	Gender Issues in Global Scenario
SS 6368	Sociology of Gender Issues
SS 6373	Women Studies
SS 6371	Sociology of Sexuality
SS 6231	Globalization: Issues and Debates
SS 6357	Global Governance
SS 6369	Sociology of Science, Knowledge and Technology
SS 6359	Industrial Sociology
SS 6358	Immigration in Contemporary Perspectives
SS 6352	Sociology of Migration and Urbanization
SS 6302	Sustainable Development
SS 6351	Social Change and Development
SS 6365	Rethinking Global Development: New Frameworks for Understanding Poverty, Inequality and Growth in 21 Century
SS 6354	Community Organizing and Development
SS 6364	Religion and Development
SS 6362	Population and Development: Current Issues and Future Implications
SS 6361	Leadership in Sociology: Theory and Practice
SS 6238	Sacred and Secular

PhD (Psychology)

SS 6343	Applications of Contemporary Data Analysis Tools
SS 6266	Use, Construction and Interpretation of Tests
SS 6342	School Psychology
SS 6341	Cross-Cultural Psychology
SS 6346	Community Psychology
SS 6348	Environmental Psychology
SS 6349	Gender Psychology
SS 6347	Consumer Behavior
SS 6251	Perspective in Organizational Psychology
SS 6252	Psychological Assessment in Organizational Psychology
SS 6253	Psychology of Leadership
SS 6319	Organizational Culture & Development
SS 6317	Marketing and Consumer Psychology
SS 6318	Organizational Conflict and Management
SS 6314	Assessment and Diagnosis-I
SS 6344	Assessment and Diagnosis-II
SS 6254	Psychotherapy and Counseling-I
SS 6255	Psychotherapy and Counseling-II
SS 6316	Psychophysiology and Psychopharmacology
SS 6345	Clinical Internship

10.0 Appendix B - Electives

10.5 Education

MASTER OF SCIENCE IN EDUCATIONAL LEADERSHIP AND MANAGEMENT (MSELM)

Elective Courses

ELM 5235	Sociological Issues in Education /Access/Out comes and Quality
ELM 5233	Learning Effectiveness in Higher Education Contexts
ELM 5136	Use of Technology in Education
ELM 5231	Education in the Context of Conflict
ELM 5236	Socio-Politics of Language Policy in Educational Contexts
ELM 5133	Change Management in Education
ELM 5134	Educational Policy and Practice
ELM 5135	Assessment and Evaluation in Education
ELM 5138	School Evaluation and Monitoring
ELM 5131	Teacher Education
ELM 5234	Research Philosophy
ELM 5137	Professional Development and Management in Education
ELM 5232	Finance and Resource Management
ELM 5132	Organizational Development
ELM 5237	Advanced Educational Psychology
ELM 5139	Curriculum Development and Instructional Design
ELM 5238	Educational Leadership Theory and Practices

10.0 Appendix B - Electives

10.6 Media Sciences

BACHELOR OF MEDIA SCIENCES (BMS)

Elective Courses

MD 4854	Illustration
MD 4732	Typography
MD 4867	Topics in Film and Television
MD 4878	Design for Social Change
MD 4886	Game Design
MD 4883	Urdu Literature in South Asian Cinema
MD 4873	Modernity in Cinema in Bengal
MD 4774	Media Anthropology
MD 4776	Media Convergence and Innovation
MD 4888	Culture and Media in Sindh
MD 4792	Music Production and Design
MD 4892	Music Theory and Performance
MD 4788	Sindh Studies

MASTER OF SCIENCE IN MEDIA STUDIES (MSMD)

Elective Courses

GEC Stream:

MD 5361	Advanced Content Research
MD 5366	Syndication – Foreign and Indigenous Content
MD 5365	Story Telling and Screenplay Writing
MD 5364	Production Management
MD 5362	Directing
MD 5363	Format Shows and Reality Shows
MD 5111	Media, Art & Technology
MD 5212	Theories of Visual Culture
MD 5414	Theories of Communication Design

Production Stream:

MD 5382	Camera and Lights
MD 5384	Film Analysis
MD 5365	Story Telling and Screenplay Writing
MD 5383	Documentary Making
MD 5362	Directing
MD 5381	Aesthetics of Film
MD 5211	Theories of Film and Television
MD 5311	Urban Geographies and Visual Culture

Journalism Stream:

MD 5374	Global Journalism
MD 5371	Beat Reporting
MD 5375	Investigative Journalism
MD 5376	Multi-Format News Reporting
MD 5372	Data Journalism
MD 5373	Fashion and Entertainment Journalism
MD 5112	Media and Post-Colonialism
MD 5314	Media, Politics and Governance
MD 5315	Issues in International Media

Electives will be offered depending on the availability of the resources.

MASTER OF ADVERTISING (MoA)

Elective Courses

MD 5351	Campaign Strategy
MD 5264	Copywriting and Advertising Conceptualization
MD 5265	Digital Advertising
MD 5272	Advanced Integrated Marketing Communication
MD 5352	New Media Advertising
MD 5273	Strategic Brand Management
MD 5275	Strategic Creative Development
MD 5353	Media Planning and Strategy
MD 5274	Consumer Engagement
MD 5271	Advertising Account Management

Electives will be offered depending on the availability of the resources.

10.0 Appendix B - Electives

10.7 Biosciences

BACHELOR OF SCIENCE IN BIOSCIENCES (BS-Biosciences)

Elective Courses

Molecular Biology

BIO 4721	Advance Biochemical Techniques
BIO 4722	Medical Transcription
BIO 4723	Virology
BIO 4822	Nanotechnology
BIO 4725	Advanced Molecular Techniques
BIO 4726	Applied Enzymology
BIO 4727	Systems Biology

Biotechnology

BIO 4721	Advance Biochemical Techniques
BIO 4724	Telemedicine
BIO 4823	Stem Cell Research
BIO 4727	Food Biotechnology
BIO 4825	Fermentation Biotechnology
BIO 4826	Medical Biotechnology
BIO 4726	Applied Enzymology
BIO 4728	Techniques in Biotechnology

BACHELOR OF SCIENCE IN BIOTECHNOLOGY (BS-BTC)

BTC 4723	Medical Transcription
BTC 4823	Nanotechnology
BTC 4821	Advanced Molecular Techniques
BTC 4825	Virology
BTC 4824	Systems Biology
BTC 4721	Advance Biochemical Techniques
BTC 4724	Stem cell Research
BTC 4725	Telemedicine
BTC 4822	Marine Biotechnology
BTC 4722	Fungal Biotechnology

MASTER OF SCIENCE IN BIOSCIENCES (MS-BIO)

Elective Courses

BIO 5131	Biocomputation
BIO 5132	Cancer Biology
BIO 5133	Medical Biotechnology
BIO 5134	Environmental and Industrial Biotechnology
BIO 5135	Applied Biotechnology
BIO 5136	Drug Discovery and Development
BIO 5137	Food Sampling Techniques and Analysis
BIO 5138	Plant Biotechnology
BIO 5231	Food Quality Management System
BIO 5232	Applied Immunology
BIO 5233	Techniques in Diagnostics
BIO 5234	Biocatalysis and Enzymology
BIO 5235	Clinical Biochemistry
BIO 5236	Fermentation Design and Engineering
BIO 5237	Food Toxicology and Adulteration
BIO 5238	Molecular Dynamics

MASTER OF SCIENCE IN BIOSCIENCES (MS-BIO)

BIO 5131	Biocomputation
BIO 5132	Cancer Biology
BIO 5133	Medical Biotechnology
BIO 5134	Environmental and Industrial Biotechnology
BIO 5135	Applied Biotechnology
BIO 5136	Drug Discovery and Development
BIO 5137	Food Sampling Techniques and Analysis
BIO 5138	Plant Biotechnology
BIO 5231	Food Quality Management System
BIO 5232	Applied Immunology
BIO 5233	Techniques in Diagnostics
BIO 5234	Biocatalysis and Enzymology
BIO 5235	Clinical Biochemistry
BIO 5236	Fermentation Design and Engineering
BIO 5237	Food Toxicology and Adulteration
BIO 5238	Molecular Dynamics

MASTER OF SCIENCE IN BIOTECHNOLOGY (MS-BIOT)

Elective Courses

BTC 5121	Advances in Bioinformatics
BTC 5122	Bioethics, Biosecurity, Biosafety and Dual Use Education
BTC 5123	Regulation of Gene Expression
BTC 5221	Advances in Health Biotechnology
BTC 5222	Metabolic Engineering and Biofuels
BTC 5223	Protein Engineering and Enzyme Technology

DOCTOR OF PHILOSOPHY IN BIOSCIENCES (PH.D. BIO)

Elective Courses

BIO 6121	Advances in Molecular Genetics
BIO 6122	Advances in Plant Biotechnology
BIO 6123	Analytical Techniques for Biomolecules
BIO 6124	Computational and Systems Biology
BIO 6125	Oncobiology
BIO 6126	Principles of Synthetic Biology
BIO 6221	Advanced Immunology
BIO 6222	Next Generation Sequencing Techniques
BIO 6223	Biomaterials Science and Engineering
BIO 6224	Cell Signaling Mechanisms

10.0 Appendix B - Electives

10.8 Public Health

Bachelor of Science in Public Health (BS-PH)

Elective Courses

BPH 4727	Prison Health
BPH 4852	Health Financing
BPH 4726	Health Inventory Management
BPH 4729	School Health
BPH 4725	Health Information System
BPH 4826	Health Project Management
BPH 4722	Art and Public Health
BPH 4822	Community Dentistry
BPH 4823	Community Psychiatry
BPH 4723	Community Nursing
BPH 4824	Food Safety
BPH 4821	Addiction and Social Rehabilitation
BPH 4827	Nuclear Medicine
BPH 4828	Sports Medicine
BPH 4721	Adolescent and Sexual Health
BPH 4728	Risk Management
BPH 4724	Geriatrics
BPH 4705	Quality Management in Health Care
BPH 4701	Disaster Management
BPH 4802	Health Economics
BPH 4804	International Health

Master of Science in Public Health (MSPH)-36ch & 60ch

List of Elective Courses/Tracks

Track 1 Epidemiology and Biostatistics

MSP 5223	Advanced Epidemiology and Biostatistics
MSP 5224	Epidemiological Report Writing
MSP 5321	Epidemiology of Communicable & Non-communicable Disease

Track 2 Health Policy & Management and Health Economics

MSP 5323	Human Resource Management for Health
MSP 5222	Health Policy, Planning & Management
MSP 5226	Financial Management
MSP 5225	Applied Health Economics
MSP 5322	Health Care Financing
MSP 5324	Supply Chain Management

Track 3 Applied Nutrition and Reproductive Health

MSP 5327	Nutrition for Children, Adolescent & Mothers
MSP 5228	Community Management of Malnutrition
MSP 5227	International Food Organizations
MSP 5325	Demography and Population Dynamics
MSP 5221	Community Based RH Interventions
MSP 5326	Gender Development

10.0 Appendix B - Electives

10.9 LLB

LLB (UNIVERSITY OF LONDON)

Elective Courses

LA 3028	Introduction to Islamic Law
LA 3021	Company Law
LA 3013	Commercial Law
LA 2029	Protection of Human Rights
LA 3019	Family Law
LA 3013	Public International Law
LA 3008	Administrative Law
LA 3203	Law Skills Portfolio
LA 3024	EU Law

11.0 Appendix C - Major Requirements

11.1 Social Sciences

BACHELOR OF SCIENCE IN SOCIAL SCIENCES (BSSS)

Major Courses

Psychology

SS 4111 Abnormal Psychology
SS 4112 Developmental Psychology
SS 4134 Cognitive Psychology
SS 4135 Educational Psychology
SS 4234 Psychodynamics
SS 4268 History of Psychology
SS 4167 Child Psychology
SS 4156 Clinical Psychology
SS 4114 Personality Theories
SS 4255 Counseling and Psychotherapy
SS 4211 Psychological Testing
SS 4236 Positive Psychology
SS 4168 Experimental Psychology
SS 4267 Forensic Psychology
SS 4262 Physiological Psychology

Sociology

SS 4269 Civil Society
SS 4271 Peace Movements
SS 4138 Corporate Social Responsibility
SS 4141 Mass Media and Society
SS 4237 Post-Colonial State and Social Development
SS 4238 Social Entrepreneurship
SS 4239 Social Justice
SS 4241 Sociology of Education
SS 4242 The Sociology of Poverty
SS 4196 Social Theories-I
SS 4296 Social Theories-II
SS 4171 Class, Caste, and Ethnicity in South Asia
SS 4172 Political Sociology
SS 4272 Social Change in Pakistan
SS 4169 Citizenship
SS 4273 Urbanization
SS 4295 Criminology
SS 4197 The Sociology of Religion

International Relations

SS 4275 Foreign Policy and International Politics
SS 4274 Diplomacy, Conflict Resolution and Confidence Building Measures
SS 4219 Peace Research
SS 4222 Strategic Studies
SS 4176 Globalization and Global Governance
SS 4277 Modern Ideologies
SS 4174 Central and West Asian Studies

SS 4175 European Studies
SS 4177 Middle Eastern Studies
SS 4179 Politics of Terrorism
SS 4178 Muslim World
SS 4276 International Institutions
SS 4278 Political Geography
SS 4119 Arms Control and Disarmament
SS 4279 US and International Politics

Sindh Studies

SS 4188 Geography and Geology of Sindh
SS 4287 History and Politics of Sindh
SS 4288 Irrigation System of Sindh
SS 4185 Agriculture in Sindh
SS 4285 Archaeology of Sindh
SS 4186 Anthropology and Culture of Sindh
SS 4286 Art and Architecture in Sindh
SS 4187 Ethnomusicology of Sindh
SS 4289 Sindh's Economy and Commerce
SS 4292 Survey of Sindhi Literature
SS 4189 Philosophy of Sindh
SS 4192 Sindh's Sociology I: Education and Language Policy
SS 4193 Sindh's Sociology II: Social Structures and Development
SS 4194 Sindh's Sociology III: Health, Gender, and Feminism
SS 4293 The Sindhi Diaspora
SS 4291 Sindh's Geopolitical Exigencies
SS 4191 Sindh's Botanical and Zoological Heritage

Economics

SS 4139 Gender and Development
SS 4147 Development and Planning
SS 4181 Capabilities and Human Development
SS 4281 Fiscal and Monetary Economics
SS 4261 Mathematical Economics
SS 4183 Industrial Economics
SS 4284 Trade Economics
SS 4128 Agriculture Economics
SS 4182 Game Theory
SS 4283 Labour Economics
SS 4282 Growth
SS 4184 Poverty and Inequality
SS 4228 History of Economic Thoughts
SS 4249 Pakistan Economy
SS 4251 Sustainable Development

11.0 Appendix C - Major Requirements

11.2 Media Sciences

BACHELOR OF MEDIA SCIENCES (BMS)

Major Courses

Film & Television Production

MD 4726	Directing I
MD 4728	Directing II
MD 4781	Sound design
MD 4821	Cinematography
MD 4825	Screenwriting
MD 4872	Visual Storytelling
MD 4868	Production Practices III
MD 4724	Documentary Vision
MD 4764	Production Design
MD 4765	Basic Lighting
MD 4829	Screenwriting II
MD 4789	Green Screen Keying and Composition for Production VFX
MD 4889	Narrative and Social Change
MD 4xxx	Music Score for Film and Television

Advertising Strategy & Design

MD 4723	Advance Animation
MD 4731	Advertising Research
MD 4739	Advertising Design and Concept
MD 4754	Creative Aspect in Advertising
MD 4779	Digital Brand Communication
MD 4835	Consumer Behavior
MD 4843	Campaign Strategy
MD 4846	New Media Advertising
MD 4847	Copywriting
MD 4736	Integrated Marketing Communications
MD 4837	Media Planning
MD 4782	Interaction Design
MD 4787	Digital Design and Publishing
MD 4834	Advertising in Pakistan
MD 4833	Brand Management
MD 4xxx	Digital Media Planning
MD 4xxx	Fundamentals of Digital Advertising

Journalism

MD 4757	Feature Writing I
MD 4879	Multimedia Journalism
MD 4864	Investigative Journalism & Crisis Reporting
MD 4877	The International Newsroom
MD 4783	TV Journalism
MD 4859	Introduction to Photojournalism
MD 4839	Reporting the News
MD 4793	Citizen Journalism
MD 4893	Environmental Journalism
MD 4794	Fashion Journalism

MD 4895	Peace Journalism
MD 4795	Reporting of Politics & Governance
MD 4894	Foreign Correspondence
MD 4896	Sports Reporting
MD 4796	Digital Public Relations and Blogging
MD 4797	Introduction to Digital News Reporting

Electives will be offered depending on the availability of the resources.

12.0 Appendix D - Supporting Courses

12.1 Computerl Sciences

BACHELORS OF SCIENCE IN COMPUTER SCIENCES (BSCS)

Supporting Courses

CSC 2122 Differential Equations
CSC 1202 Multivariate Calculus
CSC 2123 Graph Theory
CSC 2121 Theory of Programming Languages
CSC 2125 Numerical Computing

Coverage of relevant pre-requisite will be ensured while allowing any of the following courses from this category:

13.0 Appendix E - Guidelines for Thesis

13.1 Media Sciences

BACHELOR OF MEDIA SCIENCES (BMS)

Guidelines for Film and Television Production Thesis

Students are required to produce a short film or documentary of 10-20 minute duration. Students must complete at least 6 out of 7 relevant major elective courses before they attempt Thesis II.

- Students are also required to develop a screenplay for the film. Students can adopt or build on some exceptional projects/screenplay they developed for a course previously done. Screenplay will be developed through a process of research on situations, locations, and characters. The process must demonstrate involvement in the development of contexts, character sketches, etc. Students will be required to work on screenplay in close coordination with the assigned advisor who will guide them through critique in advisory thesis meeting. Students are required to submit all research/related work in a report along with a screenplay.

- Documentary students are required to do extensive research such as primary research, meetings with related experts, preliminary interviews, archival research, etc. All of this must be submitted in a research report.

- Students are supposed to show a grasp of different areas of production i.e. cinematography, production design, casting, editing, and sound design as a director of the project.

- Students are required to work in coordination with a team of students performing theirs roles as cinematographers, production designers, gaffers, producers, editors, sound technicians, etc. Only members of current student body – batchmates and juniors – can be a part of student's production crew. Any outside professional help will be penalized unless allowed by the advisor and the department. The advisor must approve shooting schedule and crew list. Advisor or faculty members or staff may visit shooting locations.

- Students are required to utilize the equipment available in the department. Use of some outside equipment will be permitted. Use of outside equipment will require consent and permission of the advisor.

- The advisor will review the editing process.

- Students will be required to have at least 8 regular meetings with the advisor.

- DEADLINES will be strictly enforced.

BACHELOR OF MEDIA SCIENCES (BMS)

Guidelines for Journalism Thesis

Journalism students should take on a substantial theme on issues related to current affairs, international relations, and/or socio-cultural issues demonstrating multimedia, feature writing, investigative reporting, incisive interviewing, editorial judgment and compelling storytelling skills. The central focus should be on taking on a relevant journalistic topic of current and/or historical nature that requires substantial research and a critical analysis of the issues involved.
Students must complete at least 6 out of 7 relevant major elective courses before they attempt Thesis II.

The project would include two components:

1. Major component of the project should be an investigative or feature piece of at least 5000 words. The piece can also be subdivided into a series of articles or features of maximum five parts of at least 1000-1500 words each.

2. Supplementary component should be multimedia elements incorporating video, stills and/or audio depending on the nature of the topic. Advisor will help decide on the number elements required for the second component

The final thesis should be presented as a combination of written and multimedia components in an online portal specifically devoted to showcase the project.

BACHELOR OF MEDIA SCIENCES (BMS)

Guidelines for Advertising Thesis

Students will be dealt with individually by advisors from the full-time faculty and will be free to chose their own topics, and must commit to either a strategy or design thesis at the very beginning of the semester. Students must complete at least 6 out of 7 relevant major elective courses before they attempt Thesis II.

At the start of thesis student must commit to Advertising Design or Advertising Strategy as major of their thesis.

There is a methodical, linear structure of deadlines and presentations that must be given to the advisors and students. The deadlines are :
Student must complete:

a) Research,

b) Ideation & Concepts,

c) Prototypes\ Product Strategy (this covers Thesis I), and

d) Final Execution Strategy / Design (Thesis II)

e) Detailed Structure will be provided at the start of Thesis I.

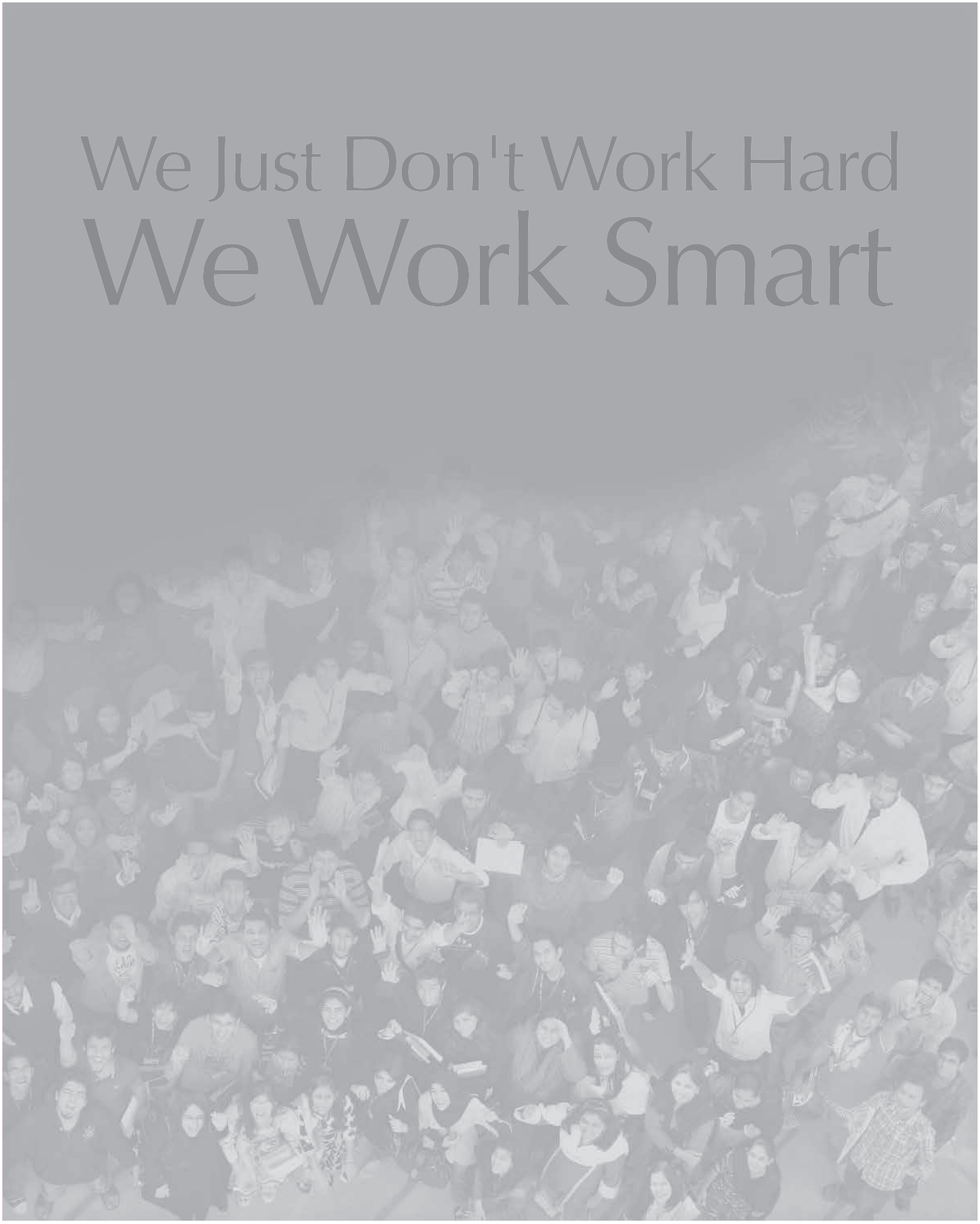
Fulltime instructors will give all students a clear process and deliverables in the form of a brief for each step of the thesis and each deadline

DEADLINES will be strictly enforced

Note:
Students must finish all pre-requisite requirements before Thesis I and II. Students on academic probation cannot enroll for thesis credits.

Thesis (6-credits) is offered over two semesters as Thesis I & II in the 7th (Fall) and the following 8th (Spring) semester respectively. Thesis I is pass/fail whereas in thesis II a grade is awarded to students. Final grade comprises 50% of advisors' grade and 50% of the average of external jury members' grades.

We Just Don't Work Hard
We Work Smart



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