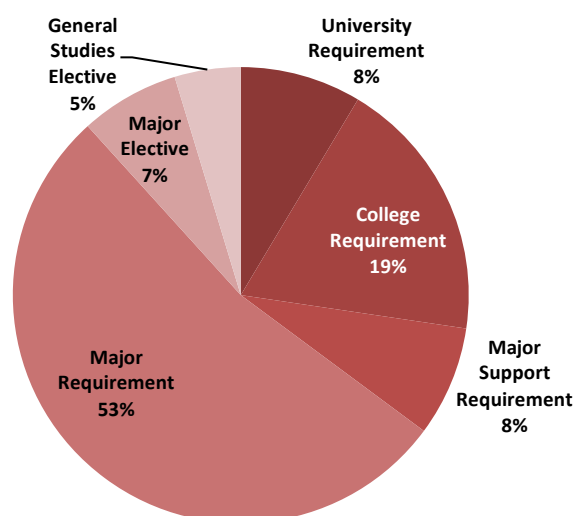


B.Sc. in Actuarial Sciences 2018

Program Components

| Course Type | CRD |
|---|------------|
| University Requirement (UR) | 11 |
| College Requirement (CR) | 24 |
| Major Support Requirement (MSR) | 10 |
| Major Requirement (MR) | 68 |
| Major Elective (ME) ¹ | 9 |
| General Studies Elective (GSE) ² | 6 |
| Training (Internship) Yes | 1 |
| Total Credit (CRD) | 128 |



¹Students should select two ME courses from list 1 plus one course from list 2.

² Student should select two General Studies Electives from list 3.

Teaching Language: English

Detailed Study Plan

Year 1 - Semester 1

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite | Major GPA |
|-------------|----------------------------------|--------------|------|-----|-------------|---------------|-----------|
| | | LEC | PRAC | CRD | | | |
| HRLC 107 | Human Rights | 2 | 0 | 2 | UR | None | No |
| ENGL 125 | English For Science I (SCI.) | 3 | 0 | 3 | CR | None | No |
| ITCS 113 | Computer Programming I | 3 | 2 | 3 | CR | None | No |
| MATHS 121 | Calculus and Analytic Geometry I | 3 | 0 | 3 | CR | None | No |
| PHYCS 101 | General Physics I | 3 | 3 | 4 | CR | None | No |

Year 1 - Semester 2

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite | Major GPA |
|-------------|-----------------------------------|--------------|------|-----|-------------|---------------|-----------|
| | | LEC | PRAC | CRD | | | |
| CHEMY 101 | General Chemistry I | 3 | 3 | 4 | CR | None | No |
| ENGL 126 | English For Science II (SCI.) | 3 | 0 | 3 | CR | ENGL 125 | No |
| ITCS 114 | Computer Programming II | 3 | 2 | 3 | MSR | ITCS 113 | No |
| MATHS 122 | Calculus and Analytic Geometry II | 4 | 0 | 4 | MR | MATHS 121 | YES |
| STAT 271 | Introduction to Probability | 3 | 0 | 3 | MR | MATHS 121 | YES |

Year 2 - Semester 3

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite | Major GPA |
|-------------|------------------------------------|--------------|------|-----|-------------|------------------------|-----------|
| | | LEC | PRAC | CRD | | | |
| BIOLS 102 | General Biology I | 3 | 3 | 4 | CR | None | No |
| MATHS 204 | Calculus and Analytic Geometry III | 3 | 0 | 3 | MR | MATHS 122 | YES |
| ECON 140 | Microeconomics | 3 | 0 | 3 | MR | None | YES |
| ACC 112 | Financial Accounting I | 3 | 0 | 3 | MR | None | YES |
| STAT 371 | Probability and Statistics I | 3 | 0 | 3 | MR | MATHS 122 and STAT 271 | YES |

Year 2 - Semester 4

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite | Major GPA |
|-------------|-------------------------------|--------------|------|-----|-------------|---------------|-----------|
| | | LEC | PRAC | CRD | | | |
| MATHS 211 | Linear Algebra | 3 | 0 | 3 | MR | MATHS 121 | YES |
| MATHS 205 | Differential Equations | 3 | 0 | 3 | MR | MATHS 122 | YES |
| ECON 141 | Macroeconomics | 3 | 0 | 3 | MR | ECON 140 | YES |
| ACC 113 | Financial Accounting II | 3 | 0 | 3 | MR | ACC 112 | YES |
| STAT 372 | Probability and Statistics II | 3 | 0 | 3 | MR | STAT 371 | YES |

Year 3 - Semester 5

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite | Major GPA |
|-------------|------------------------|--------------|------|-----|-------------|------------------------|-----------|
| | | LEC | PRAC | CRD | | | |
| PHYCS 102 | General Physics II | 3 | 3 | 4 | MSR | PHYCS 101 | No |
| STAT 374 | Regression Analysis | 3 | 0 | 3 | MR | STAT 372 and MATHS 211 | YES |
| FIN 220 | Financial Management I | 3 | 0 | 3 | MR | ACC 113 | YES |
| MATHS 371 | Theory of Interest | 3 | 0 | 3 | MR | MATHS 122 | YES |
| GSE xxx | Free Elective | 3 | 0 | 3 | GSE | None | No |

Year 3 - Semester 6

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite | Major GPA |
|----------------|-----------------------------------|--------------|------|-----|-------------|------------------|-----------|
| | | LEC | PRAC | CRD | | | |
| ITCS 214 | Data Structures | 3 | 2 | 3 | MSR | ITCS 114 | No |
| STAT 381 | Time Series Analysis | 3 | 0 | 3 | MR | STAT 372 | YES |
| FIN 320 | Financial Management II | 3 | 0 | 3 | MR | FIN 220 | YES |
| MATHS 372 | Financial Economics for Actuaries | 3 | 0 | 3 | MR | MATHS 371 | YES |
| Maths/Stat xxx | Maths/Stat Elective | 3 | 0 | 3 | ME | As per ME List 1 | YES |

Training Requirement

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite | Major GPA |
|-------------|----------------------------------|--------------|------|-----|-------------|------------------------|-----------|
| | | LEC | PRAC | CRD | | | |
| MATHS 399 | Internship for Actuarial Science | 0 | 0 | 1 | MR-Training | Passes 75 credit hours | Yes |

Year 4 - Semester 7

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite | Major GPA |
|----------------|------------------------|--------------|------|-----|-------------|------------------|-----------|
| | | LEC | PRAC | CRD | | | |
| ISLM 101 | Islamic Culture | 3 | 0 | 3 | UR | None | No |
| ARAB 110 | Arabic Language Skills | 3 | 0 | 3 | UR | None | No |
| Maths/Stat xxx | Maths/Stat Elective | 3 | 0 | 3 | ME | As per ME List 1 | YES |
| MATHS 471 | Life Contingencies I | 3 | 0 | 3 | MR | MATHS 371 | YES |
| FIN 425 | Corporate Finance | 3 | 0 | 3 | MR | FIN 320 | YES |
| MATHS 473 | Loss Models I | 3 | 0 | 3 | MR | STAT 372 | YES |

Year 4 - Semester 8

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite | Major GPA |
|-------------|---|--------------|------|-----|-------------|------------------|-----------|
| | | LEC | PRAC | CRD | | | |
| HIST 122 | Modern History of Bahrain and Citizenship | 3 | 0 | 3 | UR | None | No |
| MATHS 472 | Life Contingencies II | 3 | 0 | 3 | MR | MATHS 471 | YES |
| MATHS 474 | Loss Models II | 3 | 0 | 3 | MR | MATHS 473 | YES |
| GSE xxx | Free Elective | 3 | 0 | 3 | GSE | None | No |
| BUS/IT xxx | Business/IT Elective | 3 | 0 | 3 | ME | As per ME List 2 | No |

Major Elective Courses

List 1 Mathematics and Statistics ME Electives

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite | Major GPA |
|-------------|--|--------------|------|-----|-------------|-----------------------|-----------|
| | | LEC | PRAC | CRD | | | |
| MATHS 253 | Set Theory | 3 | 0 | 3 | ME | MATHS 121 | Yes |
| MATHS 303 | Analysis I | 3 | 0 | 3 | ME | MATHS 204 | Yes |
| MATHS 311 | Abstract Algebra I | 3 | 0 | 3 | ME | MATHS 211 | Yes |
| MATHS 331 | Numerical Analysis I | 3 | 0 | 3 | ME | MATHS 122 & ITCS 114 | Yes |
| MATHS 461 | Elementary Partial Differential Equation | 3 | 0 | 3 | ME | MATHS 204 & MATHS 205 | Yes |
| STAT 391 | Non Parametric Statistics | 3 | 0 | 3 | ME | STAT 271 | Yes |
| STAT 394 | Linear programming | 3 | 0 | 3 | ME | MATHS 122 & STAT 271 | Yes |
| STAT 471 | Decision Theory | 3 | 0 | 3 | ME | STAT 372 | Yes |
| STAT 473 | Introduction to Multivariate Analysis | 3 | 0 | 3 | ME | MATHS 211 & STAT 372 | Yes |
| STAT 474 | Statistical Modelling | 3 | 0 | 3 | ME | STAT 372 | Yes |

List 2 Business and IT ME Electives

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite | Major GPA |
|-------------|------------------------------------|--------------|---|---|-------------|---------------|-----------|
| FIN 424 | Investment Management | 3 | 0 | 3 | ME | FIN 320 | No |
| FIN 426 | International Financial Management | 3 | 0 | 3 | ME | FIN 320 | No |
| FIN 434 | Financial Risk Management | 3 | 0 | 3 | | FIN 320 | No |
| SBF 270 | Islamic Banking and Finance | 3 | 0 | 3 | | FIN 220 | No |
| ITCS 316 | Human-Computer Interaction | 3 | 0 | 3 | | ITCS 214 | No |
| ITIS 243 | Web Design and Development I | 3 | 0 | 3 | | ITCS 114 | No |
| ITCS 285 | Database Management Systems | 3 | 0 | 3 | | ITCS 214 | No |

List 3 Free Electives for MATHS

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite |
|-------------|----------------------------------|--------------|------|-----|-------------|---------------|
| | | Lec | Prac | CRD | | |
| FREN 141 | French I | 3 | 0 | 3 | GSE | ----- |
| FREN 142 | French II | 3 | 0 | 3 | GSE | FREN 141 |
| CHL 101 | Introduction to Chinese Language | 3 | 0 | 3 | GSE | ----- |
| CHL 102 | Basic Chinese Language | 3 | 0 | 3 | GSE | CHL 101 |

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite |
|-------------|--|--------------|------|-----|-------------|----------------------|
| | | Lec | Prac | CRD | | |
| EDTC 100 | Teaching and Learning TechNology | 3 | 0 | 3 | GSE | ----- |
| EDPS 144 | Psychology of Learning and Memory | 3 | 0 | 3 | GSE | ----- |
| ART 133 | Fundamentals of Music and Its Appreciation | 3 | 0 | 3 | GSE | ----- |
| ART 141 | Drawing and Painting | 2 | 1 | 3 | GSE | ----- |
| ART 221 | Traditional Music of Bahrain and Its Application | 3 | 0 | 3 | GSE | ----- |
| EDAR 126 | Playing on PiaNo and Org 1 | 3 | 0 | 3 | GSE | ----- |
| JAPN 101 | Japanese Level I | 3 | 0 | 3 | GSE | ----- |
| JAPN 102 | Japanese Level II | 3 | 0 | 3 | GSE | JAPN 101 |
| GERM 101 | Introduction to German | 3 | 0 | 3 | GSE | ----- |
| KL 101 | Korean Language I | 3 | 0 | 3 | GSE | ----- |
| KL 102 | Korean Language II | 3 | 0 | 3 | GSE | KL 101 |
| ENGL 130 | Introduction to Literature | 3 | 0 | 3 | GSE | ----- |
| PSYC 103 | Introduction to Psychology | 3 | 0 | 3 | GSE | ----- |
| PSYC 120 | Psychology of Marriage | 3 | 0 | 3 | GSE | ----- |
| PSYC 211 | Educational Psychology | 3 | 0 | 3 | GSE | ----- |
| PSYC 281 | Thinking Skills | 3 | 0 | 3 | GSE | PSYC 103 or EDPS 241 |
| SOCIO 161 | Introduction to Sociology | 3 | 0 | 3 | GSE | ----- |
| SOCIO 181 | Introduction to Anthropology | 3 | 0 | 3 | GSE | ----- |
| SOCIO 191 | Citizenship, Identity and Globalization | 3 | 0 | 3 | GSE | ----- |
| SOCIO 224 | Sociology of Health | 3 | 0 | 3 | GSE | ----- |
| SOCIO 226 | Sociology of Arabian Gulf | 3 | 0 | 3 | GSE | ----- |
| HISTO 212 | Contemporary History of The Arab World | 3 | 0 | 3 | GSE | ----- |
| HISTO 281 | Landmarks of Islamic Civilisation | 3 | 0 | 3 | GSE | ----- |
| ARAB 141 | Modern Arabic Lit. | 3 | 0 | 3 | GSE | ----- |
| ARAB 242 | Arabic Poetry In The Renaissance Period | 3 | 0 | 3 | GSE | ----- |
| ISLM 114 | Quranic Sciences | 3 | 0 | 3 | GSE | ----- |
| ISLM 136 | Biography of The Prophet | 3 | 0 | 3 | GSE | ----- |
| ISLM 141 | Introduction to Shari'a | 3 | 0 | 3 | GSE | ----- |
| ISLM 252 | Islamic Doctrine | 3 | 0 | 3 | GSE | ----- |
| LAW 101 | Introduction to Legal Studies | 3 | 0 | 3 | GSE | ----- |
| LAW 102 | History of Law | 3 | 0 | 3 | GSE | ----- |
| LAW 106 | Constitutional Law I | 3 | 0 | 3 | GSE | ----- |

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite |
|-------------|---|--------------|------|-----|-------------|---------------------|
| | | Lec | Prac | CRD | | |
| MGT 341 | Entrepreneurship and Small Business Management for Non Business Student | 3 | 0 | 3 | GSE | ----- |
| TL 101 | Turkish Language | 3 | 0 | 3 | GSE | ----- |
| GSE XXX | Other electives | X | X | 3 | GSE | Department Approval |

General Studies Elective Courses List

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite |
|-------------|--|--------------|------|-----|-------------|---------------|
| | | Lec | Prac | CRD | | |
| ARAB 141 | Modern Arabic Lit. | 3 | 0 | 3 | GSE | ----- |
| ARAB 242 | Arabic Poetry In The Renaissance Period | 3 | 0 | 3 | GSE | ----- |
| ART 133 | Fundamentals of Music and Its Appreciation | 3 | 0 | 3 | GSE | ----- |
| ART 141 | Drawing and Painting | 2 | 1 | 3 | GSE | ----- |
| ART 221 | Traditional Music of Bahrain and Its Application | 3 | 0 | 3 | GSE | ----- |
| CHL 101 | Introduction to Chinese Language | 3 | 0 | 3 | GSE | ----- |
| CHL 102 | Basic Chinese Language | 3 | 0 | 3 | GSE | CHL 101 |
| EDAR 126 | Playing on Piano and Org 1 | 3 | 0 | 3 | GSE | ----- |
| EDPS 144 | Psychology of Learning and Memory | 3 | 0 | 3 | GSE | ----- |
| EDTC 100 | Teaching and Learning Technology | 3 | 0 | 3 | GSE | ----- |
| ENGL 130 | Introduction to Literature | 3 | 0 | 3 | GSE | ----- |
| FREN 141 | French I | 3 | 0 | 3 | GSE | ----- |
| FREN 142 | French II | 3 | 0 | 3 | GSE | FREN 141 |
| GERM 101 | Introduction to German | 3 | 0 | 3 | GSE | ----- |
| HISTO 212 | Contemporary History of The Arab World | 3 | 0 | 3 | GSE | ----- |
| HISTO 281 | Landmarks of Islamic Civilisation | 3 | 0 | 3 | GSE | ----- |
| ISLM 114 | Quranic Sciences | 3 | 0 | 3 | GSE | ----- |
| ISLM 136 | Biography of The Prophet | 3 | 0 | 3 | GSE | ----- |
| ISLM 141 | Introduction to Shari'A | 3 | 0 | 3 | GSE | ----- |
| ISLM 252 | Islamic Doctrine | 3 | 0 | 3 | GSE | ----- |
| JAPN 101 | Japanese Level I | 3 | 0 | 3 | GSE | ----- |
| JAPN 102 | Japanese Level II | 3 | 0 | 3 | GSE | JAPN 101 |
| KL 101 | Korean Language I | 3 | 0 | 3 | GSE | ----- |
| KL 102 | Korean Language II | 3 | 0 | 3 | GSE | KL 101 |
| LAW 101 | Introduction to Legal Studies | 3 | 0 | 3 | GSE | ----- |
| LAW 102 | History of Law | 3 | 0 | 3 | GSE | ----- |
| LAW 106 | Constitutional Law I | 3 | 0 | 3 | GSE | ----- |
| PHEDE 214 | Principles of Educational Statistics | 3 | 0 | 3 | GSE | ----- |
| PSYC 103 | Introduction to Psychology | 3 | 0 | 3 | GSE | ----- |
| PSYC 120 | Psychology of Marriage | 3 | 0 | 3 | GSE | ----- |
| PSYC 211 | Educational Psychology | 3 | 0 | 3 | GSE | ----- |

| Course Code | Course Title | Course Hours | | | Course Type | Pre requisite |
|-------------|---|--------------|------|-----|-------------|----------------------|
| | | Lec | Prac | CRD | | |
| PSYC 281 | Thinking Skills | 3 | 0 | 3 | GSE | PSYC 103 or EDPS 241 |
| SOCIO 161 | Introduction to Sociology | 3 | 0 | 3 | GSE | ----- |
| SOCIO 181 | Introduction to Anthropology | 3 | 0 | 3 | GSE | ----- |
| SOCIO 191 | Citizenship, Identity and Globalization | 3 | 0 | 3 | GSE | ----- |
| SOCIO 224 | Sociology of Health | 3 | 0 | 3 | GSE | ----- |
| SOCIO 226 | Sociology of Arabian Gulf | 3 | 0 | 3 | GSE | ----- |
| TL 101 | Turkish Language | 3 | 0 | 3 | GSE | ----- |
| GSE XXX | Other electives | X | X | 3 | GSE | Department Approval |

Course Description

Course Code: ACC 112 **Course Title:** Financial Accounting I

A survey of the accounting cycle; recording changes in financial position; ledger; journal; trial balance; income measurement; adjusting and closing entries; accounting for merchandising operations; special journals and subsidiary ledgers; accounting for cash; receivables; inventories; plant and equipment.

Course Code: ACC 113 **Course Title:** Financial Accounting II

Accounting for partnerships and corporations: capital stock; dividends and retained earnings; long term liabilities and investment; statement of changes in financial position; cash flows, analysis and interpretation of financial statements, manufacturing accounts.

Course Code: ECON 140 **Course Title:** MicroecoNomics

Introduction to ecoNomic concepts, the ecoNomic way of thinking, decision-making, the study of scarcity, opportunity cost, how prices are determined and why they change, factors determining cost and the nature of costs, and how firms, under different market conditions, make price and output decisions in short run and long run.

Course Code: ECON 141 **Course Title:** MacroecoNomics

The study of the determination and systematic movement of broad aggregates such as total output, national ecoNomic growth, unemployment and inflation. How macroecoNomic policies such as fiscal and monetary policies affect the ecoNomic aggregates. The measurement of macroecoNomic variables, unemployment, determinants of real GDP and price level, fiscal policy, money, banking and monetary policy.

Course Code: FIN 220 **Course Title:** Financial Management

Functions of finance, legal and tax environments, role of financial markets, compound interest and present value, theory of financial valuation, basics of capital budgeting, financial analysis and planning, working capital management, short-term financing.

Course Code: FIN 320 **Course Title:** Financial Management II

Detailed analysis of capital budgeting under conditions of uncertainty: cost of capital, capital structure, dividend policy, long-term financing, capital markets, investment banking, common stocks, preferred stocks, debt instruments, leasing, convertibles, mergers and acquisitions, introduction to international finance, small company finance, and failure and reorganization.

Course Code: FIN 425 **Course Title:** Corporate Finance

Case applications of basic financial concepts, recent empirical and theoretical findings in the field of corporate finance. Financial analysis and planning, capital expenditure analysis, capital structure and dividend policies, corporate structure and restructuring, mergers and acquisitions, financial restructuring, and international corporate equity offerings.

Course Code: MATHS 122 **Course Title:** Calculus and Analytic Geometry II

Methods of integration. Applications to areas; arc length; volumes; etc. Parametric equations. Polar coordinates. Infinite series. Taylors' theorem and power series.

Course Code: MATHS 204 **Course Title:** Calculus and Analytic Geometry III

Vectors. Vector functions and vector analysis. Partial differentiation. Tangent planes. Normal lines. Chain rule. Maxima-minima. Higher order derivatives. Line integrals and multiple integrals. Applications to volumes and surface areas. Green's and Stokes' theorems.

Course Code: MATHS 211 **Course Title:** Linear Algebra
Fields. Vector spaces. Linear dependence and independence. Bases. Dimensions. Subspaces. Quotient spaces. Linear transformations. Connection with matrices. Change of bases (PAQ and PAP). Eigen-values. Characteristic polynomial. Minimal polynomial. Canonical forms in simple cases. Real and complex inner-product spaces. Orthogonal bases. Orthogonal and complex unitary matrices and their eigen-values. Orthogonal and unitary reduction of real symmetric and complex Hermitian matrices.

Course Code: MATHS 205 **Course Title:** Differential Equations
Differential equations of first order and their solution. Separable and exact equations. Equations convertible to separable type. Higher order linear equations with constant coefficients (homogeneous and Non-homogeneous). Power series method for second order linear equations. Variation of parameters. Laplace transform technique. Applications of differential equations.

Course Code: MATHS 371 **Course Title:** Theory of Interest
Introduction to the mathematics of interest and the evaluation of interest related products including annuities with Non-contingent payments, loans, bonds, general cash flows, portfolios, and immunization. Sources of interest rates, stochastic interest rates, and financial instruments such as shorts, swaps, and options. General derivatives, forwards and futures, hedging and investment strategies.

Course Code: MATHS 372 **Course Title:** Financial Economics for Actuaries
Forward, futures, swaps, and other derivatives. Option pricing theory. Interest rate modeling and simulation. Brownian motion. Black-Scholes formula. Delta-Hedging. Exotic Options. Risk Management techniques.

Course Code: MATHS 471 **Course Title:** Life Contingencies I
This course introduces students to the mathematical theory of contingencies. Topics include survival distributions, individual risk models, life tables, topics from life insurance, life annuities and benefit premiums.

Course Code: MATHS 472 **Course Title:** Life Contingencies II
This course is a continuation of the study of life contingencies. Topics include benefit reserve, multiple life functions, multiple decrement models, random and deterministic survivorship group, valuation of pension plans, and applications.

Course Code: MATHS 473 **Course Title:** Loss Models I
This course introduces students to the construction and evaluation of actuarial models. Topics include measures of risk, characteristics of actuarial models, severity models, frequency models and aggregate loss models.

Course Code: MATHS 474 **Course Title:** Loss Models II
This course is a continuation of the study of actuarial models. Topics include estimation of data, parameter estimation, model selection, simulation and credibility.

Course Code: STAT 271 **Course Title:** Introduction to Probability
Descriptive Statistics. Sample spaces. Probability functions. Conditional probability. Independence. Combinatorics. Random variables and their distributions. Distribution functions. Geometric, binomial, Poisson and other discrete distributions. Uniform, Normal and other continuous distributions. Some limit theorems.

Course Code: STAT 371 **Course Title:** Probability and Statistics I
Random variables and probability distributions. Moment generating Functions. Joint Probability distributions. Normal, gamma, Chi square and other distributions. Central Limit Theorem.

Course Code: STAT 372 **Course Title:** Probability and Statistics II
Point and interval estimation. Sampling distributions. t -, Chi-square and F-distributions. Test of hypotheses. Likelihood ratio test. Neyman-Pearson lemma. Correlation and regression.

Course Code: STAT 374 **Course Title:** Regression Analysis
Simple linear regression. Multiple linear regression. Analysis of residuals. Multicollinearity. Biased estimation. Sensitivity analysis. Selection of Variables. Non-linear regression. Response surface and correlation analysis.

Course Code: STAT 381

Course Title: Time Series Analysis

Introduction to linear and stationary time series. Autocorrelation modeling. Autoregression modeling. Moving average. ARMA models. ARIMA models. Introduction to spectral analysis of a time series. Introduction to Non-linear time series.

Course Code: MATHS 399

Course Title: Internship for Actuarial Science

The Internship course is designed to provide an opportunity to gain work experience related to the student's specified field of science, in a supervised workplace environment for a period of 8 consecutive weeks. The student shall submit a report upon completion.

Major Support Requirement Courses Descriptions

Course Code: PHYCS 102 **Course Title:** General Physics II

Electric charges and fields; Coulomb's and Gauss's laws; electric potential; capacitors and dielectrics; direct current circuits; Kirchoff's rules; magnetic field and flux; ampere's law; induced emf; Lenz's law; mutual and self inductance; AC circuits; RLC circuit.)

Course Code: ITCS 114 **Course Title:** Computer Programming II

This course covers key concepts of object-oriented programming. Topics include object oriented design, encapsulation, event handlers, memory management, arrays, exception handlers, searching algorithms, programming applications.

Course Code: ITCS 214 **Course Title:** Data Structures

This course covers data structures and their implementations in an object-oriented programming language. Topics include subtyping, abstract base class, lists, stacks, queues, trees, graphs, hash tables, strategies for choosing appropriate data structure.

College Requirement Courses Descriptions

Course Code: CHEMY 101 **Course Title:** General Chemistry I

Significant figures, chemical formulas and equations; mass relations, limiting reactants and theoretical yield; Physical behavior of gases; electronic structure, periodic table, covalent bonding; Lewis structures, Molecular structures, hybridization; molecular orbitals, solutions; colligative properties. Related practical work.

Course Code: BIOLS 102 **Course Title:** General Biology I

Properties of life; atoms, molecules and chemical bonds; biomolecules; cell structure and function; bioenergetics (intermediary metabolism); cell reproduction; Mendelian genetics; structure of DNA; RNA and protein synthesis; molecular genetics.

Course Code: PHYCS 101 **Course Title:** General Physics I

Units and measurements; brief review of vectors; Newton's laws of motion; projectile motion; work and energy; impulse and momentum; rotational dynamics; equilibrium of a rigid body; periodic motion.

Course Code: MATHS 121 **Course Title:** Calculus and Analytic Geometry I

Algebra. Functions and graphs. Trigonometry. Conic sections. Limits and continuity. Derivatives and integrals. Applications of derivatives which include mean value theorem, extrema of functions and optimization. Definite integrals and the Fundamental Theorem of Calculus. Derivatives and integrals of exponential, logarithmic and inverse Trigonometric functions.

Course Code: ITCS 113 **Course Title:** Computer Programming I

This course introduces problem solving and fundamental programming concepts and techniques implemented by a high-level programming language. Topics include primitive and compound data types, syntax, semantics, expressions, assignment, input, output, conditional and iterative control structures, functions.

Course Code: ENGL 125 **Course Title:** English for Science I (SCI)

This is the first of two integrated language courses designed specifically for science majors. Special attention is given to scientific vocabulary and the unique features of technical writing. The course includes an extensive reading programme via a self-access lab.

Course Code: ENGL 126 **Course Title:** English for Science II (SCI)

English for Science is the second of two integrated language courses designed specifically for Science majors. Special attention is given to scientific vocabulary and the unique features of technical writing.

University Requirements Courses Descriptions

Course Code: ARAB 110

Course Title: Arabic Language Skills

This course focuses on basic Arabic skills including form, function, and meaning. It also helps the student to appreciate and understand structures and approach them from a critical point of view, through various genres in literature.

Course Code: HIST 122

Course Title: Modern History of Bahrain and Citizenship

Spatial identity of Bahrain: Brief history of Bahrain until the 18th century; the historical roots of the formation of the national identity of Bahrain since the 18th century; the modern state and evolution of constitutional life in Bahrain; the Arabic and Islamic dimensions of the identity of Bahrain; the core values of Bahrain's society and citizenship rights (legal, political, civil and economic); duties; responsibilities and community participation; economic change and development in Bahrain; Bahrain's Gulf, Arab and international relations.

Course Code: HRLC 107

Course Title: Human Rights

This course deals with the principles of human rights in terms of the definition of human rights, scope, sources with a focus on the International Bill of Human Rights; The Charter of the United Nations; Universal Declaration of Human Rights; The International Covenant on Economics, Social and Culture rights; Convention against Torture and other Cruel; Mechanics and the Constitutional Protection of Rights and Public Freedoms in Kingdom of Bahrain.

Course Code: ISLM 101

Course Title: Islamic Culture

An introduction to the general outline and principles of Islamic culture, its general characteristics, its relationships with other cultures, general principles of Islam in beliefs, worship, legislation and ethics.