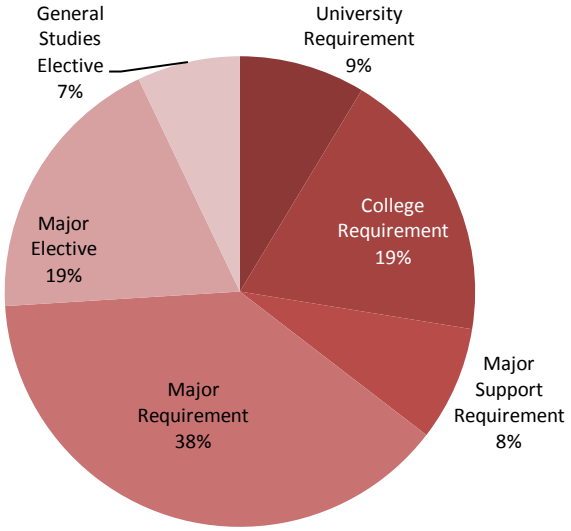
B.Sc. in Mathematics (Single Track) 2017

Program Components

Course Type	CRD
University Requirement (UR)	**11**
College Requirement (CR)	**24**
Major Support Requirement (MSR)	**10**
Major Requirement (MR)	**49**
Major Elective (ME)[1]	**24**
General Studies Elective (GSE)[2]	**9**
Training (Internship) **N0**	**0**
Total Credit (CRD)	**127**



[1]Single track students should select five ME courses from list 4 plus exactly one course from each of lists 1,2, and 3 for a total of eight ME courses.

[2] Student should select three General Studies Electives, one of them should be from Humanities and Social Science.
Note:

Two courses may be selected from any Department in the University including the Department of major specialization, provided the course content is not lower than the level that the student has attained in his specialization. It should not be a science course prepared by the college of science for other colleges.

- HU/SS Courses - Humanities and Social Science Component: Any course from the following:
  Humanities: Fine Arts, History, American Studies, Classics, Communications, Foreign Language, Music, Philosophy, Theatre, Literature (Arabic), and Religion (comparative).
  Social Science: Anthropology, Economics, Education, Geography, History, Psychology, Sociology, Women's Studies, and Political Science.

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			
ISLM 101	Islamic Culture	3	0	3	UR	-----	No
ENGL 125	English for Science I (SCI)	3	0	3	CR	-----	No
ITCS 113	Computer Programming I	3	2	3	CR	-----	No
MATHS 121	Calculus and Analytic Geometry I	3	0	3	CR	-----	Yes
PHYCS 101	General Physics I	3	3	4	CR	-----	No

Year 1 - Semester 2

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
ENGL 126	English for Science II (SCI)	3	0	3	CR	ENGL 125	No
PHYCS 102	General Physics II	3	3	4	MSR	PHYCS 101	No
ARAB 110	Arabic Language Skills	3	0	3	UR	–––––	No
MATHS 122	Calculus and Analytic Geometry II	4	0	4	MR	MATHS 121	Yes
ITCS 114	Computer Programming II	3	2	3	MSR	ITCS 113	No

Year 2 - Semester 3

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
MATHS 204	Calculus and Analytic Geometry III	3	0	3	MR	MATHS 122	Yes
MATHS 205	Differential Equations	3	0	3	MR	MATHS 122	Yes
BIOLS 102	General Biology I	3	3	4	CR	-----	No
HIST 122	Modern History of Bahrain and Citizenship	3	0	3	UR	-----	No

Year 2 - Semester 4

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
CHEMY 101	General Chemistry I	3	3	4	CR	-----	No
MATHS 211	Linear Algebra	3	0	3	MR	MATHS 121	Yes
MATHS 253	Set Theory	3	0	3	MR	MATHS 121	Yes
STAT 271	Introduction to Probability	3	0	3	MR	MATHS 121	Yes
GSE XXX	Humanities / Social Science	X	X	3	GSE	-----	No

Year 3 - Semester 5

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
MATHS 303	Analysis I	3	0	3	MR	MATHS 204	Yes
MATHS 311	Abstract Algebra I	3	0	3	MR	MATHS 211	Yes
MATHS 331	Numerical Analysis I	3	0	3	MR	MATHS 122 & ITCS 114	Yes
STAT 371	Probability and Statistics I	3	0	3	MR	MATHS 122 & STAT 271	Yes
MATHS 3/4XX	Major Elective 1 from list 1	3	0	3	ME	As per ME list	Yes

Year 3 - Semester 6

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
MATHS 304	Analysis II	3	0	3	MR	MATHS 303	Yes
MATHS 312	Abstract Algebra II	3	0	3	MR	MATHS 311	Yes
MATHS 381	Methods of Applied Mathematics	3	0	3	MR	MATHS 204 & MATHS 205	Yes
MATHS 341	Complex Analysis I	3	0	3	MR	MATHS 204	Yes
MATHS 4XX	Major Elective 2 from list 2	3	0	3	ME	As per ME list	Yes
HRLC 107	Human Rights	2	0	2	UR	-----	No

Year 4 - Semester 7

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
MATHS 401	Applied Mathematics I	3	0	3	MR	MATHS 381	Yes
MATHS 395	Problem Solving in Mathematics	3	0	3	MR	MATHS 381	Yes
MATHS 4XX	Major Elective 3 from from list 3	3	0	3	ME	As per ME list	Yes
MATHS 3/4XX	Major Elective 4 from list 4	3	0	3	ME	As per ME list	Yes
GSE XXX	Free Elective Course 1	X	X	3	GSE	-----	No

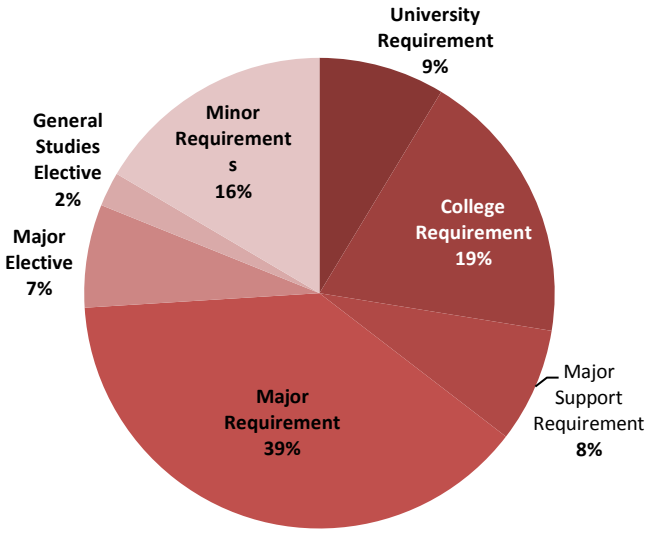
Year 4 - Semester 8

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
MATHS 3/4XX	Major Elective 5 from list 4	3	0	3	ME	As per ME list	Yes
MATHS 4XX	Major Elective 6 from list 4	3	0	3	ME	As per ME list	Yes
MATHS 4XX	Major Elective 7 from list 4	3	0	3	ME	As per ME list	Yes
MATHS 4XX	Major Elective 8 from list 4	3	0	3	ME	As per ME list	Yes
GSE XXX	Free Elective Course 2	X	X	3	GSE	-----	No

B.Sc. in Mathematics (Major Mathematics) 2017

Program Components

Course Type	CRD
University Requirement (UR)	**11**
College Requirement (CR)	**24**
Major Support Requirement (MSR)	**10**
Major Requirement (MR)	**49**
Major Elective (ME)[1]	**9**
General Studies Elective (GSE)[2]	**3**
Minor Requirements (Minor)[3]	**21/22**
Training (Internship) **No**	**0**
Total Credit (CRD)	**127/128**



[1]Major students should select three ME courses from List 1-2.

[2] Student should select one Elective course from Humanities and Social Science.
Note:

- HU/SS Courses - Humanities and Social Science Component: Any course from the following:
  Humanities: Fine Arts, History, American Studies, Classics, Communications, Foreign Language, Music, Philosophy, Theatre, Literature (Arabic), and Religion (comparative).
  Social Science: Anthropology, Economics, Education, Geography, History, Psychology, Sociology, Women's Studies, and Political Science.

[3] Student should take seven courses as a Minor in one of the following specializations: Biology, Chemistry, Computer Science, Physics, Statistics, or Astronomy according to the requirements of the department offering the minor.

Important Note: Overlapping Courses
If any of the listed courses in the minor requirements tables below is covered as part of the major degree requirements, then the student must replace them with an equal number of courses from the minor field , which are at the same level or higher. The total number of minor courses must be seven for all fields, with a minimum of 21 credit hours.

Detailed Study Plan

Year 1 - Semester 1

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
ARAB 110	Arabic Language Skills	3	0	3	UR	-----	No
ITCS 113	Computer Programming I	3	2	3	CR	-----	No
ENGL 125	English for Science I (SCI)	3	0	3	CR	-----	No
MATHS 121	Calculus and Analytic Geometry I	3	0	3	CR	-----	Yes
PHYCS 101	General Physics I	3	3	4	CR	-----	No

Year 1 - Semester 2

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
HRLC 107	Human Rights	2	0	2	UR	-----	No
MATHS 122	Calculus and Analytic Geometry II	4	0	4	MR	MATHS 121	Yes
PHYCS 102	General Physics II	3	3	4	MSR	PHYCS 101	No
ITCS 114	Computer Programming II	3	2	3	MSR	ITCS 113	No
ENGL 126	English for Science II (SCI)	3	0	3	CR	ENGL 125	No

Year 2 - Semester 3

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
MATHS 204	Calculus and Analytic Geometry III	3	0	3	MR	MATHS 122	Yes
MATHS 205	Differential Equations	3	0	3	MR	MATHS 122	Yes
CHEMY 101	General Chemistry I	3	3	4	CR	-----	No
ISLM 101	Islamic Culture	3	0	3	UR	-----	No
STAT 271	Introduction to Probability	3	0	3	MR	MATHS 121	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 253	Set Theory	3	0	3	MR	MATHS 121	Yes
BIOLS 102	General Biology I	3	3	4	CR	-----	No
HIST 122	Modern History of Bahrain and Citizenship	3	0	3	UR	-----	No
ITCS 214	Data Structures	3	2	3	MSR	ITCS 114	No

Year 3 - Semester 5

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
MATHS 303	Analysis I	3	0	3	MR	MATHS 204	Yes
MATHS 331	Numerical Analysis I	3	0	3	MR	MATHS 122 & ITCS 114	Yes
STAT 371	Probability and Statistics I	3	0	3	MR	MATHS 122 & STAT 271	Yes
Minor	Course 1	X	X	3/4	Minor	As per Minor	No
Minor	Course 2	X	X	3	Minor	As per Minor	No
GSE XXX	Humanities / Social Science	X	X	3	GSE	-----	No

Year 3 - Semester 6

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
MATHS 304	Analysis II	3	0	3	MR	MATHS 303	Yes
MATHS 311	Abstract Algebra I	3	0	3	MR	MATHS 211	Yes
MATHS 381	Methods of Applied Mathematics	3	0	3	MR	MATHS 204 & MATHS 205	Yes
MATHS 341	Complex Analysis I	3	0	3	MR	MATHS 204	Yes
Minor	Course 3	X	X	3	Minor	As per Minor	No

Year 4 - Semester 7

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
MATHS 312	Abstract Algebra II	3	0	3	MR	MATHS 311	Yes
MATHS 395	Problem Solving in Mathematics	3	0	3	MR	MATHS 381	Yes
MATHS 401	Applied Mathematics I	3	0	3	MR	MATHS 381	Yes
Minor	Course 4	X	X	3	Minor	As per Minor	No
Minor	Course 5	X	X	3	Minor	As per Minor	No

Year 4 - Semester 8

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
MATHS 3/4XX	Major Elective 1 from list 4	3	0	3	ME	As per ME list	Yes
MATHS 4XX	Major Elective 2 from list 4	3	0	3	ME	As per ME list	Yes
MATHS 4XX	Major Elective 3 from list 4	3	0	3	ME	As per ME list	Yes
Minor	Course 6	X	X	3	Minor	As per Minor	No
Minor	Course 7	X	X	3	Minor	As per Minor	No

Major Elective Courses

List 1

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
MATHS 352	Number Theory	3	0	3	ME	MATHS 121	Yes
MATHS 411	Commutative Algebra	3	0	3	ME	MATHS 312	Yes

List 2

MATHS 415	Topology I	3	0	3	ME	MATHS 253 & MATHS 303	Yes
MATHS 417	Functional Analysis	3	0	3	ME	MATHS 211 & MATHS 303	Yes

List 3

MATHS 451	Topics in Geometry	3	0	3	ME	MATHS 253	Yes
MATHS 452	Differential Geometry	3	0	3	ME	MATHS 204	Yes

List 4

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
MATHS 352	Number Theory	3	0	3	ME	MATHS 121	Yes
MATHS 411	Commutative Algebra	3	0	3	ME	MATHS 312	Yes
MATHS 415	Topology I	3	0	3	ME	MATHS 253 & MATHS 303	Yes
MATHS 417	Functional Analysis	3	0	3	ME	MATHS 211 & MATHS 303	Yes
MATHS 451	Topics in Geometry	3	0	3	ME	MATHS 253	Yes
MATHS 452	Differential Geometry	3	0	3	ME	MATHS 204	Yes
MATHS 305	History of Mathematics	3	0	3	ME	-----	Yes
MATHS 307	Introduction to Lie Group for Differential Equations	3	0	3	ME	MATHS 204 & MATHS 205	Yes
MATHS 332	Numerical Analysis II	3	0	3	ME	MATHS 331	Yes
MATHS 385	Analytical Mechanics	3	0	3	ME	MATHS 204 & MATHS 205	Yes
MATHS 387	Fluid Mechanics	3	0	3	ME	MATHS 385	Yes
MATHS 388	Vector Analysis And Tensor Analysis	3	0	3	ME	MATHS 204	Yes
MATHS 402	Applied Mathematics II	3	0	3	ME	MATHS 401	Yes
MATHS 405	Theory of Differential Equations	3	0	3	ME	MATHS 205	Yes
MATHS 416	Topology II	3	0	3	ME	MATHS 415	Yes
MATHS 441	Complex Analysis II	3	0	3	ME	MATHS 341	Yes
MATHS 461	Elementary Partial Differential Equation	3	0	3	ME	MATHS 204 & MATHS 205	Yes
MATHS 499	Independent Project	0	0	3	ME	Department Approval	Yes

Course Description

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 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 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. Orthonormal bases. Orthogonal and complex unitary matrices and their eigen-values. Orthogonal and unitary reduction of real symmetric and complex Hermitian matrices.

Course Code: MATHS 253 **Course Title:** Set Theory
Elementary logic. Concept of sets. Relations and functions. Denumerable sets and nondenumerable sets. Cardinal numbers and cardinal arithmetic. The axiom of choice and some of its equivalent forms.

Course Code: MATHS 303 **Course Title:** Analysis I
Basic properties of Real number (R). Rigorous discussion of Sequences and Series in R. Topology of R. Rigorous discussion of limits; continuity and differentiation of functions of one variable (real).

Course Code: MATHS 304 **Course Title:** Analysis II
Riemann integral. Metric spaces and topology of metric spaces. Continuous functions on metric spaces. Banach fixed point theorem. Weirstrass approximation theorem. Pointwise and uniform convergence of sequences and series of functions. Application to power series and Fourier series. Differentiation of function from Rm to Rn.

Course Code: MATHS 305 **Course Title:** History of Mathematics
Primitive Origins. Egyptian Mathematics. Mesopotamia: Babylonian Mathematics. Greek: Ionia and the Pythagorean. Euclid of Alexandria. China and India. Islamic Mathematics. Mathematics of Middle ages and Renaissance. Modern Mathematics.

Course Code: MATHS 307 **Course Title:** Introduction to Lie Group for Differential Equations
First integral of systems of ordinary differential equations, Symmetric form of system, Integration of partial differential equations, Non-homogenous equations, Transformation groups, Infinitesimal transformations, Lie equations and the exponential map, canonical variables, invariants and invariant equations, The frame of a differential equations, Extension of group actions to derivatives, Generators of prolonged groups, Symmerty groups, Calculation of infinitesimal symmetries, Lie algebras and integration of non-linear differential equations.

Course Code: MATHS 311 **Course Title:** Abstract Algebra I
Groups. Homomorphisms. Subgroups. Cyclic groups. Permutation groups, groups of symmetries. Lagrange's theorem. Normal subgroups. Quotient groups. Fundamental theorem of group homomorphisms. Conjugacy. Sylow's theorems. direct products.

Course Code: MATHS 312 **Course Title:** Abstract Algebra II
Rings and their homomorphisms. Ideals. Residue class rings. Fundamental theorem of ring homomorphisms. Integral domains. Fields. Prime and maximal ideals. Factorization in integral domains. Gauss theorem. Euclidean and principal ideal domains. Field, algebraic, normal, and finite extension.

Course Code: MATHS 331 **Course Title:** Numerical Analysis I
Computer arithmetic. Use of mathematical subroutine packages. Solution of equations and systems of equations (linear and nonlinear). Interpolation. Numerical differentiation and integration.

Course Code: MATHS 332 **Course Title:** Numerical Analysis II
Numerical solution of ordinary differential equations (initial and boundary value problems). Eigenvalues and eigenvectors of a matrix. Curve fitting and approximation. Introduction to partial differential equations and their numerical solution.

Course Code: MATHS 341 **Course Title:** Complex Analysis I
Complex numbers. Analytic functions. Power series. Taylor series. Cauchy integral theorem and formula. Residues. Contour integration.

Course Code: MATHS 352 **Course Title:** Number Theory
Divisibility. Primes. Linear Congruences. Fermat's Theorem. Wilson's Theorem. Power Residues. Quadratic Reciprocity. Arithmetic Functions. Dirichlet Product. Some Diophatine Equations. Irrational Numbers. Algebraic Numbers.

Course Code: MATHS 381 **Course Title:** Methods of Applied Mathematics
Review of Stokes' and divergence theorems. Fourier series and Fourier transforms. Laplace transforms. Partial differential equations. Special functions.

Course Code: MATHS 385 **Course Title:** Analytical Mechanics
Virtual work. Shearing Stress and bending moments. Space forces. Hydrostatics. Catenary. Newtonian Mechanics. Rectilinear motion of a particle. General motion of a particle in three dimensions. Non reference System. Central forces and celestial mechanics. Dynamics of Systems of many particles. Mechanics of rigid bodies in two and three dimensions. Lagrange Mechanics. Dynamics of oscillating system.

Course Code: MATHS 387 **Course Title:** Fluid Mechanics
Kinematics of fluids. Equation of continuity. Euler's equations motion. Bernouli's equation. Impulsive motion in two dimensions. Sources and sinks. Irrotational motion. Vortex motion. Blasiu's theorem. Waves Navier - stokes equations. Conformal representation.

Course Code: MATHS 388 **Course Title:** Vector Analysis And Tensor Analysis
Orthogonal curvilinear coordinates. Potential theory. Cartesian Tensor. The Summaton convention. Orthogonal rotation of axes. Tensor of Order zero and unity. Stress tensor. Tensors of order m. Alternating Symbol. Proper and axial Tensor.

Course Code: MATHS 395 **Course Title:** Problem Solving in Mathematics
Various topics on Applied Mathematics with a concentration on the application of Mathematical techniques to problems of Applied nature.

Course Code: MATHS 401 **Course Title:** Applied Mathematics
Fourier series. Solution of partial differential equations by the method of separation of variables. Solution of typical initial and boundary value problems arising in applications (heat flow. Vibrating strings and membranes). Sturm-Liouville eigenvalue problems. Green's function.

Course Code: MATHS 402 **Course Title:** Applied Mathematics II
Green's function for time independent problems. Fourier transform solutions of partial differential equations. Linear integral equations. Integro-differential equations. Initial and boundary problems. Potential theory.

Course Code: MATHS 405 **Course Title:** Theory of Differential Equations
Basic existence and uniqueness theorems. Linear differential equations. Systems of linear differential equations. Autonomous systems, variation of parameters. Oscillation of solutions. Characteristic functions. Stability theory. Liapunov functions.

Course Code: MATHS 411 **Course Title:** Commutative Algebra
Modules over commutative rings. Chain conditions. Noetherian rings. Artinian rings. Injective and projective modules.

Course Code: MATHS 415 **Course Title:** Topology I
Basic ideas of set theory, metric and topological spaces. Separation properties. Continuity and uniform continuity. Completeness. Compactness. Connectedness. Normal and locally Tychonoff's Theorem.

Course Code: MATHS 416 **Course Title:** Topology II
Simplicial complexes. Homology groups, simplicial approximation. Brouwer's Fixed Point Theorem. Homotopy groups.

Course Code: MATHS 417 **Course Title:** Functional Analysis
Linear spaces. Norms. Basic properties of Banach and Hilbert spaces. Orthogonality. Best approximation. Sequence and function spaces. Bounded linear operators. Fundamental principles of Functional Analysis. Applications to differential and integral operators.

Course Code: MATHS 441 **Course Title:** Complex Analysis II
Contour integration. Conformal mapping. Series and sequences, analytical continuation. Harmonic functions. Dirichlet's problem. Fourier and Laplace transforms.

Course Code: MATHS 451 **Course Title:** Topics in Geometry
Axiomatic systems. Euclid's treatment of geometry and its drawbacks as an axiomatic system. Elliptic and hyperbolic geometries.

Course Code: MATHS 452 **Course Title:** Differential Geometry
Discussion of curve in E3: Frenet formulas. Arbitrary speed curves. Covariant differentiation. Frame field; connection forms and structural equations. The theory of surfaces in E3 including mapping theorems. Curvature. The fundamental equation and global theorems. Isometries and intrinsic geometry of surfaces in E3: orientability and congruence of surfaces.

Course Code: MATHS 461 **Course Title:** Elementary Partial Differential Equation
Basic existence and uniqueness theorems. Linear; Quasilinear and non-linear first order equations. Linear second order equations and their classification. The Laplace Equations-the mean value property. The maximum Principle. Drichelt problem. The diffusion Equation. The Bessel functions and its zero's-orthogonality.

Course Code: MATHS 499 **Course Title:** Independent Project
The student will work with a member of the academic staff on a mathematical topic not covered in the regular curriculum. The student is expected to present one or more talks before the Department.

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.

Free Electives and General Study Electives List(Humanities and Social Science) for MATHS

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
ECON 140	Microeconomics	3	0	3	GSE	------
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	------
MGT 341	Entrepreneurship and Small Business Management for Non Business Student	3	0	3	GSE	------

Course Code	Course Title	Course Hours			Course Type	Pre requisite
		Lec	Prac	CRD		
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	------
TL 101	Turkish Language	3	0	3	GSE	------
MATHS 305	History of Mathematics	3	0	3	Free GSE	-----
MATHS 307	Introduction to Lie Group for Differential Equations	3	0	3	Free GSE	MATHS 204 & MATHS 205
MATHS 332	Numerical Analysis II	3	0	3	Free GSE	MATHS 331
MATHS 352	Number Theory	3	0	3	Free GSE	MATHS 121
MATHS 385	Analytical Mechanics	3	0	3	Free GSE	MATHS 204 & MATHS 205
MATHS 387	Fluid Mechanics	3	0	3	Free GSE	MATHS 385
MATHS 388	Vector Analysis And Tensor Analysis	3	0	3	Free GSE	MATHS 204
MATHS 402	Applied Mathematics II	3	0	3	Free GSE	MATHS 401
MATHS 405	Theory of Differential Equations	3	0	3	Free GSE	MATHS 205
MATHS 411	Commutative Algebra	3	0	3	Free GSE	MATHS 312
MATHS 415	Topology I	3	0	3	Free GSE	MATHS 253 & MATHS 303
MATHS 416	Topology II	3	0	3	Free GSE	MATHS 415
MATHS 417	Functional Analysis	3	0	3	Free GSE	MATHS 211 & MATHS 303
MATHS 441	Complex Analysis II	3	0	3	Free GSE	MATHS 341
MATHS 451	Topics in Geometry	3	0	3	Free GSE	MATHS 253
MATHS 452	Differential Geometry	3	0	3	Free GSE	MATHS 204
MATHS 461	Elementary Partial Differential Equation	3	0	3	Free GSE	MATHS 204 & MATHS 205
STAT 372	Probability and Statistics II	3	0	3	Free GSE	STAT 371
STAT 373	Statistical Packages and Simulation	3	0	3	Free GSE	STAT 271
STAT 374	Regression Analysis	3	0	3	Free GSE	MATHS 211 & STAT 372

Course Code	Course Title	Course Hours			Course Type	Pre requisite
		Lec	Prac	CRD		
STAT 378	Surveys and Sampling	3	0	3	Free GSE	STAT 371
STAT 381	Time Series Analysis	3	0	3	Free GSE	STAT 372
STAT 382	Biostatistics and Epidemiology	3	0	3	Free GSE	MATHS 121
STAT 383	Demography and Population Studies	3	0	3	Free GSE	MATHS 121
STAT 384	Bayesian Inference	3	0	3	Free GSE	STAT 371
STAT 385	Econometrics	3	0	3	Free GSE	ECON140 & STAT 271
STAT 391	Non Parametric Statistics	3	0	3	Free GSE	STAT 271
STAT 392	Operational Research I	3	0	3	Free GSE	MATHS 211
STAT 393	Operational Research II	3	0	3	Free GSE	STAT 392
STAT 394	Linear programming	3	0	3	Free GSE	MATHS 122 & STAT 271
STAT 471	Decision Theory	3	0	3	Free GSE	STAT 372
STAT 472	Analysis and Design of Experiments	3	0	3	Free GSE	STAT 372
STAT 473	Introduction to Multivariate Analysis	3	0	3	Free GSE	MATHS 211 & STAT 372
STAT 474	Statistical Modelling	3	0	3	Free GSE	STAT 372
STAT 476	Queuing systems	3	0	3	Free GSE	STAT 372
STAT 478	Introduction to Stochastic Processes	3	0	3	Free GSE	STAT 372
STAT 479	Reliability	3	0	3	Free GSE	STAT 372
GSE XXX	Other electives	X	X	3	GSE	Department Approval

Minor Degree Program Requirements

Minor in Biology

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
BIOLS 103	General Biology II	3	3	4	Minor	BIOLS 102	Yes
BIOLS 250	Microbiology	2	3	3	Minor	BIOLS 103	Yes
BIOLS 222	Plant Morphology	2	3	3	Minor	BIOLS 103	Yes
BIOLS 234	Chordate Zoology	2	3	3	Minor	BIOLS 103	Yes
BIOLS 300	Cell Biology	2	3	3	Minor	BIOLS 102	Yes
BIOLS 340	General Ecology	2	3	3	Minor	BIOLS 103	Yes
BIOLS 4XX*	(see the list below)	2	3	3	Minor	See the list below	Yes

***Students should select electives 4XX from the following:**

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
BIOLS 441	Environmental Impact Assessment	2	3	3	Minor	BIOLS 340	Yes
BIOLS 442	Conservation Biology	2	3	3	Minor	BIOLS 340	Yes
BIOLS 451	Immunology	2	3	3	Minor	BIOLS 250	Yes
BIOLS 452	Biology of Prokaryotes	2	3	3	Minor	BIOLS 250	Yes
BIOLS 481	Fish and Fisheries	2	3	3	Minor	BIOLS 234	Yes

Minor in Chemistry for Mathematics Major

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
CHEMY 102	General Chemistry II	X	X	4	Minor	CHEMY 101	Yes
CHEMY 2XX**	Minor 2 to be taken from Chemistry: Major Requirements or Major Electives List 1	X	X	3	Minor	See the list below	Yes
CHEMY 2XX**	Minor 3 to be taken from Chemistry: Major Requirements or Major Electives List 1	X	X	3	Minor	See the list below	Yes
CHEMY 3/4XX	Minor 4 to be taken from Chemistry: Major Requirements or Major Electives List 1	X	X	3	Minor	See the list below	Yes
CHEMY 3/4XX	Minor 5 to be taken from Chemistry: Major Requirements or Major Electives List 1	X	X	3	Minor	See the list below	Yes
CHEMY 3/4XX	Minor 6 to be taken from Chemistry: Major Requirements or Major Electives List 1	X	X	3	Minor	See the list below	Yes
CHEMY 3/4XX	Minor 7 to be taken from Chemistry: Major Requirements or Major Electives List 1	X	X	3	Minor	See the list below	Yes

** CHEMY 223 (Organic Chemistry for Biological Sciences) is NOT ACCEPTED among the CHEMY 2XX minor requirements.

List 1 Electives for Minor Chemistry

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
CHEMY 211	Analytical Chemistry I	3	2	3	Minor	CHEMY 102	Yes
CHEMY 221	Organic Chemistry I	3	2	3	Minor	CHEMY 102	Yes
CHEMY 231	Physical Chemistry I	3	2	3	Minor	CHEMY 102	Yes
CHEMY 241	Inorganic Chemistry I	3	2	3	Minor	CHEMY 102	Yes
CHEMY 300	Professional and Transferable Skills for Chemists	3	0	3	Minor	CHEMY 102	Yes
CHEMY 311	Analytical Chemistry II	3	0	3	Minor	CHEMY 211	Yes
CHEMY 321	Organic Chemistry II	3	0	3	Minor	CHEMY 221	Yes
CHEMY 331	Physical Chemistry II	3	0	3	Minor	CHEMY 231	Yes
CHEMY 332	Practical Physical Chemistry	0	6	3	Minor	CHEMY 331	Yes
CHEMY 333	Quantum Chemistry	3	0	3	Minor	CHEMY 201 or MATHS 122	Yes
CHEMY 341	Inorganic Chemistry II	3	0	3	Minor	CHEMY 241	Yes
CHEMY 348	Industrial Inorganic Chemistry	3	0	3	Minor	CHEMY 241	Yes
CHEMY 351	Principles and applications of Green Chemistry	3	0	3	Minor	CHEMY 211 & CHEMY 221	Yes
CHEMY 422	Physical Organic Chemistry	3	0	3	Minor	CHEMY 321	Yes
CHEMY 423	Selected Topics in Heterocyclic Chemistry	3	0	3	Minor	CHEMY 321	Yes
CHEMY 424	Natural Products	2	3	3	Minor	CHEMY 321	Yes

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
CHEMY 425	Mechanism in organic Chemistry	3	0	3	Minor	CHEMY 321	Yes
CHEMY 426	Food Chemistry	2	3	3	Minor	CHEMY 321	Yes
CHEMY 428	Industrial Organic Chemistry	3	0	3	Minor	CHEMY 321	Yes
CHEMY 431	Chemical Dynamics: Catalyst and Surface Chemistry	3	0	3	Minor	CHEMY 331	Yes
CHEMY 434	Polymer Chemistry	2	3	3	Minor	CHEMY 321	Yes
CHEMY 435	Advance Thermodynamics	3	0	3	Minor	CHEMY 331	Yes
CHEMY 438	Electrochemistry	3	0	3	Minor	CHEMY 331	Yes
CHEMY 442	Bio-inorganic Chemistry	2	3	3	Minor	CHEMY 341	Yes
CHEMY 443	Inorganic Reaction Mechanisms	3	0	3	Minor	CHEMY 341	Yes
CHEMY 452	Environmental Chemistry	2	3	3	Minor	CHEMY 312	Yes
CHEMY 453	Organic Environmental Chemistry	2	3	3	Minor	CHEMY 322	Yes
CHEMY 441	Application of Group Theory of Inorganic Chemistry	3	0	3	Minor	CHEMY 341	Yes
CHEMY 411	Analytical Chemistry III	3	0	3	Minor	CHEMY 311	Yes
CHEMY 432	Physical Chemistry III	3	0	3	Minor	CHEMY 331	Yes
CHEMY 421	Organic Chemistry III	3	0	3	Minor	CHEMY 321	Yes

Minor in Statistics for Mathematics Major

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
STAT 372	Probability and Statistics II	3	0	3	Minor	STAT 371	Yes
STAT 373	Statistical Packages and Simulation	3	0	3	Minor	STAT 271	Yes
STAT 275 or STAT 3/4XX	Introduction to Statistics using Software Minor 3 to be taken from Statistics: Major Requirements or Major Electives courses List 1	3	0	3	Minor	MATHS 121 See the list below	Yes
STAT 3/4XX	Minor 4 to be taken from Statistics: Major Requirements or Major Electives courses List 1	3	0	3	Minor	See the list below	Yes
STAT 3/4XX	Minor 5 to be taken from Statistics: Major Requirements or Major Electives courses List 1	3	0	3	Minor	See the list below	Yes
STAT 3/4XX	Minor 6 to be taken from Statistics: Major Requirements or Major Electives courses List 1	3	0	3	Minor	See the list below	Yes
STAT 3/4XX	Minor 7 to be taken from Statistics: Major Requirements or Major Electives courses List 1	3	0	3	Minor	See the list below	Yes

List 1: Electives for Minor Statistics

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
STAT 374	Regression Analysis	3	0	3	Minor	MATHS 211 & STAT 372	Yes
STAT 378	Surveys and Sampling	3	0	3	Minor	STAT 371	Yes
STAT 381	Time Series Analysis	3	0	3	Minor	STAT 372	Yes
STAT 382	Biostatistics and Epidemiology	3	0	3	Minor	MATHS 121	Yes
STAT 383	Demography and Population Studies	3	0	3	Minor	MATHS 121	Yes
STAT 384	Bayesian Inference	3	0	3	Minor	STAT 371	Yes
STAT 385	Econometrics	3	0	3	Minor	ECON140 & STAT 271	Yes
STAT 391	Non Parametric Statistics	3	0	3	Minor	STAT 271	Yes
STAT 392	Operational Research I	3	0	3	Minor	MATHS 211	Yes
STAT 393	Operational Research II	3	0	3	Minor	STAT 392	Yes
STAT 394	Linear programming	3	0	3	Minor	MATHS 122 & STAT 271	Yes
STAT 471	Decision Theory	3	0	3	Minor	STAT 372	Yes
STAT 472	Analysis and Design of Experiments	3	0	3	Minor	STAT 372	Yes
STAT 473	Introduction to Multivariate Analysis	3	0	3	Minor	MATHS 211 & STAT 372	Yes
STAT 474	Statistical Modelling	3	0	3	Minor	STAT 372	Yes
STAT 476	Queuing systems	3	0	3	Minor	STAT 372	Yes
STAT 478	Introduction to Stochastic Processes	3	0	3	Minor	STAT 372	Yes
STAT 479	Reliability	3	0	3	Minor	STAT 372	Yes

Minor in Physics for Mathematics Major

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
PHYCS 209	Bulk Properties of Matter	3	2	3	Minor	PHYCS 101	Yes
PHYCS 221	Methods of Mathematical Physics I	3	0	3	Minor	PHYCS 102 & MATHS 122	Yes
PHYCS 222	Modern Physics	3	2	3	Minor	PHYCS 102	Yes
PHYCS 324	Atomic and Molecular Physics	3	2	3	Minor	PHYCS 222	Yes
PHYCS 241 or PHYCS 3/4XX**	Introductory Electronics or Any course from the list 2	X	X	3	Minor	PHYCS 102 or See the list 2 below	Yes
PHYCS 3XX*	Any course from List 1	X	X	3	Minor	See the list 1 below	Yes
PHYCS 3/4XX**	Any course from the list 2	X	X	3	Minor	See the list 2 below	Yes

***List 1: Students should select one course 3XX from the following:**

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
PHYCS 314	Classical Mechanics	3	2	3	Minor	PHYCS 221 or MATHS 205	Yes
PHYCS 326	Quantum Mechanics I	3	2	3	Minor	PHYCS 222	Yes
PHYCS 348	Electromagnetic Theory	3	2	3	Minor	PHYCS 221 or MATHS 205	Yes
PHYCS 365	Thermal Physics	3	2	3	Minor	PHYCS 209	Yes

****List 2: Students should select one course 3/4XX from the following:**

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
PHYCS 314	Classical Mechanics	3	2	3	Minor	PHYCS 221 or MATHS 205	Yes
PHYCS 331	Physical Optics	3	2	3	Minor	PHYCS 102	Yes
PHYCS 348	Electromagnetic Theory	3	2	3	Minor	PHYCS 221 or MATHS 205	Yes
PHYCS 365	Thermal Physics	3	2	3	Minor	PHYCS 209	Yes
PHYCS 351	Solid State Physics I	3	2	3	Minor	PHYCS 222	Yes
PHYCS 425	Computational Physics	3	2	3	Minor	PHYCS 221 or MATHS 205	Yes
PHYCS 471	Nuclear Physics	3	2	3	Minor	PHYCS 326	Yes

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
PHYCS 333	Oscillations and Waves	3	2	3	Minor	PHYCS 221	Yes
PHYCS 344	Plasma Physics	3	0	3	Minor	PHYCS 348	Yes
PHYCS 353	Physics of Materials	3	2	3	Minor	PHYCS 209	Yes
PHYCS 364	Meteorology	3	2	3	Minor	PHYCS 209	Yes
PHYCS 366	Environmental Physics	3	2	3	Minor	PHYCS 209	Yes
PHYCS 382	Astronomy	3	0	3	Minor	PHYCS 102	Yes
PHYCS 383	Space Science and Technology	3	0	3	Minor	PHYCS 102	Yes
PHYCS 408	Medical Physics	3	2	3	Minor	PHYCS 209	Yes
PHYCS 421	Mathematical Physics	3	0	3	Minor	PHYCS 221	Yes
PHYCS 422	Particle Physics	3	0	3	Minor	PHYCS 326	Yes
PHYCS 427	Quantum Mechanics II	3	0	3	Minor	PHYCS 326	Yes
PHYCS 428	Space and Time	3	0	3	Minor	PHYCS 222 & PHYCS 314	Yes
PHYCS 444	Electrodynamics	3	0	3	Minor	PHYCS 348	Yes
PHYCS 462	Statistical Physics	3	0	3	Minor	PHYCS 365	Yes
PHYCS 465	Solar Energy	3	2	3	Minor	PHYCS 365	Yes
PHYCS 492	Selected Topics in Modern Physics	3	0	3	Minor	Department Approval	Yes

Minor in Astronomy

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
PHYCS 282	The Cosmic Perspective	3	0	3	Minor	PHYCS 102	Yes
PHYCS 283	Planets and the Solar System	3	0	3	Minor	PHYCS 282	Yes
PHYCS 381	Stellar Astrophysics	3	0	3	Minor	PHYCS 283	Yes
PHYCS 384	Galaxies and the Universe	3	0	3	Minor	PHYCS 381	Yes
PHYCS 385	Observational Astronomy	3	2	3	Minor	PHYCS 381	Yes
PHYCS 3/4XX*	(see the list below)	3	0	3	Minor	See the list below	Yes
PHYCS 3/4XX*	(see the list below)	3	0	3	Minor	See the list below	Yes

***Students should select electives 3/4XX from the following:**

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
PHYCS 383	Space Science and Technology	3	0	3	Minor	PHYCS 102	Yes
PHYCS 481	Solar System Dynamics	3	0	3	Minor	PHYCS 283	Yes
PHYCS 482	High-Energy Astrophysics	3	0	3	Minor	PHYCS 384	Yes
PHYCS 483	Extragalactic Astrophysics and Cosmology	3	0	3	Minor	PHYCS 384	Yes
PHYCS 485	Astronomical Data Analysis	3	2	3	Minor	PHYCS 385	Yes

Minor in Computer Science

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
ITCE 250	Digital Logic	3	2	3	Minor	ITCS 113	Yes----------
ITCE 314	Computer Networks I	3	2	3	Minor	ITCS 114 & STAT 271	Yes
ITCS 285	Database Management Systems	3	2	3	Minor	ITCS 214	Yes
ITCS 316	Human-Computer Interaction	3	2	3	Minor	ITCS 214	Yes
ITCS 389	Software Engineering I	3	2	3	Minor	ITCS 285	Yes
ITCS* 3XX/4XX	(see the list below)	3	2	3	Minor	see list below	Yes
ITCS* 3XX/4XX	(see the list below)	3	2	3	Minor	see list below	Yes

***Students should select electives ITCS 3/4XX from the following:**

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Minor GPA
		LEC	PRAC	CRD			
ITCS 333	Internet Software Development	3	2	3	Minor	ITCS 285	Yes
ITCS 444	Mobile Application Development	3	2	3	Minor	ITCS 333	Yes
ITCS 453	Multimedia and Hypermedia Systems	3	2	3	Minor	ITCS 214	Yes
ITCS 489	Software Engineering II	3	2	3	Minor	ITCS 389	Yes
ITCS 494	Selected Topics in Computer Science	3	2	3	Minor	Department Approval	Yes
ITCS 496	Physical Implementation of DBMS	3	2	3	Minor	ITCS 285	Yes

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.