

Faculty of Science

List of Courses Offered for University of Malaya Student Exchange (UMSEP) for 2018/2019 Academic Session

Bachelor							
No.	Course Code	Topic	Pre-Requisite	Credit	Course Offered		Course Description
					Semester I	Semester II	
1	GIS1008	Environmental Science	NIL	2		√	Population and industrialisation are related to environmental pollution. These cause global warming, climate change, water pollution, acid rain and ozone layer depletion. Therefore, this course will expose these issues that need to be tackled for sustaining future generation needs.
2	GIS1010	Human Nervous System	NIL	2		√	Introduction to the human nervous system from the developmental, cellular, structural and functional aspects; aiming to improve understanding of the human nervous system and various disorders that involve the human nervous system.
3	GIS1012	Lifecycle Nutrition	NIL	2	√		Students will be taught about the importance of healthy eating and its implications to healthy life at different stages of life. Section A (30%) deals with food and nutrition, section B (20%) deals with the digestive tract, digestion of food and absorption of nutrients, section C (30%) deals with the human nutritional needs at different stages of the lifecycle. The nutrient requirements during the four main stages of the human lifecycle vary considerably. The requirements for infants, children, adults and the elderly are different. There are also specific nutrients for a pregnant women and lactating mothers. Finally section D (20%) will deal with non-communicable disease associated with unhealthy eating lifestyle.
4	GIS1014	Introductory Microbiology	NIL	2	√		Introduction to Microbiology, concepts and basic knowledge in microbiology, evolution, structure and function of the parts of prokaryotic, diversity and importance of microorganisms including archaea, bacteria, fungi and viruses.
5	GIS1015	Genetics and You	NIL	2		√	Introduction to the principles and concepts related to the field of Genetics and Molecular Biology, its applications and impacts to the society.
6	SIC1001	Principles Chemistry	NIL	2	√	√	<p>Stoichiometry The mole concept, chemical formulas (empirical and molecular), balanced chemical equations (molecular and redox), percentage yield, chemical reactions in aqueous solution, molarity, and analytical chemistry (gravimetric and volumetric).</p> <p>Atomic structure Models of atomic structure (Dalton, Bohr, Quantum Theory) Wavefunction (quantisation, atomic orbitals) Many-electron atoms (Heisenberg uncertainty principle, Pauli exclusion principle, Hund's rule, Aufbau principle, electronic configuration)</p> <p>Periodic Table Trends in physical and chemical properties of elements in relation to electronic configuration (atomic size, ionic radius, ionization energy, electron affinity, electronegativity and metallic properties, acid-base and redox).</p> <p>Introduction to chemical bonding Ionic versus covalent bonding, nature of the covalent bond, valence bond theory (hybridization), molecular orbital theory</p> <p>Gas The kinetic theory of gas and equation of state for ideal and real gases.</p>
7	SIC2008	Biomolecules	SIC1003	2	√	√	<p>Carbohydrates: mono-, oligo-, polysaccharides – structure, classification, nomenclature, reactions and analysis.</p> <p>Lipids and terpenes: fatty acids, acyl glycerols, prostaglandins, terpenoids, steroids – structure, reactions, and biological relevance.</p> <p>Proteins: amino acids, peptides, and proteins – structure, synthesis and degradation analysis.</p> <p>Nucleic Acids: DNA, RNA and protein biosynthesis.</p>
8	SIE1001	Biology of Organisms	NIL	2	√	√	Characteristics of living organisms; classification based on evolution, morphology and molecular biology; naming of organisms based on the binomial system; description of the major taxa from virus, bacteria, protist, fungi, bryophytes, ferns, gymnosperms, angiosperms, to invertebrate and vertebrate animals; adaptations, life cycles and inter-relationships among organisms.
9	SIE 2004	Mycology	SIE1001 Biology of Organisms	3		√	This course is an introductory to fungal classification, biology, diversity, ecology and taxonomy. This course will discuss sampling and culture technique involved in mycology, inventory and documentation aspects for conservation purpose and importance of fungi in biotechnology.

10	SIE 2008	Plant Structure, Function and Physiology	SIJ1001 Life Process	3	√		This course first introduces the three plant tissue systems and their cellular components followed by discussion on the structural diversity of the vegetative organs (root, stem, leaf and meristem). This is followed by the following topics: leaf morphogenesis and secondary growth in stem and root; morphological and anatomical adaptations in the organs associated with specific functions and habitat; mechanisms in water absorption, water transport, phloem translocation, photosynthesis in C3, C4 and CAM plants, the role of stomata in transpiration. Finally, the formation and development of the reproductive organs, their diversity and adaptations for life on earth are discussed.
11	SIF1001	Mathematical Method I	NIL	3	√	√	Matrices and solutions for sets of linear equations; partial derivatives of functions of multiple variables; Multiple integrals; Vector analysis; Ordinary differential equations
12	SIF1004	Modern Physics	NIL	2	√	√	Special theory of relativity; Quantum Theory; Atomic matter; Nuclear Physics and Radioactivity; Particle physics; Elementary particles and forces. Cosmology and astrophysics;
13	SIG1001	Introductionn to the Earth	NIL	2	√	√	Origins and structure of the Earth. Mineral and rocks. Rock cycle and geological time. Plate tectonics as a force in the formation of earthquakes, volcanoes, mountain ranges and continental drift.
14	SIG1002	Earth Surface Processes	NIL	2	√	√	Processes that change the earth's surface. Weathering. Erosion and deposition by natural agents. Rock cycle. Diagenesis and sedimentary rocks. Principles of stratigraphy, correlation and facies.
15	SIH1001	Population Biology	NIL	2	√	√	Students learn various aspects of populations that include populations of plants, animals, and human. Students are also exposed to environmental phenomena such as acid rain and global warming and their effects on populations and ecosystems. Basic population genetics, properties of population, population growth and interaction between species and the environment.
16	SIH1002	Environmental Chemistry	NIL	2	√		Distribution, transport and fate of major pollutants in the environment. Principles of environmental monitoring and sampling, sample storage and pretreatment. Introduction to basic concepts in environmental chemistry, chemical analysis and chemical equilibrium.
17	SIH1003	Plant & Environment	NIL	2		√	Introduction to plant system, structure and function. Energy conservation in photosynthesis. Introduction to environmental issues. Role of plant in mitigating the environmental issues. Plant-environment stresses. Plant-environment interactions and examples.
18	SIH2008	Environmental Health and Safety	NIL	2		√	Introduction to the concept of occupational health, safety and environment. Identification, assessment and control of hazards at workplace, accident investigation method at workplace, safety process management and risk assessment. Knowledge and calculation of TLVs (Threshold Limit Values) for safe working environment. Visit to laboratories in order to observe health and safety procedures are being practised will be carried out.
19	SIJ1001	Life Process	NIL	2	√	√	This course discusses the structures and roles of chemical components of cell at the atoms, molecules and macromolecules level. Enzymes catalysis, types and control of activity. Membrane biology and its role in transportation process are introduced. The concept of energy and thermodynamics. Photosynthesis: light and dark reactions. Cell respiration: aerobic and anaerobic. This course ends with the growth and development of plants and animals e.g. morphogenesis, metamorphosis, dormancy and regeneration.
20	SIJ2011	Environmental Biochemistry	SIJ1001 Life Process	3		√	The ecosystem: interaction between the biotic and abiotic components. The energy concept and trophic levels. Biogeochemical cycles for carbon, nitrogen, sulphur, phosphorus. Petroleum industry, impacts of oil spills to the natural environment and biological treatment. Xenobiotics: benefits and impacts. Bioconversion of polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). Environmental impacts of anthropogenic activities e.g. deforestation, urbanisation, monoculture farming, mining.
21	SIJ2012	Nutritional Biochemistry	SIJ1001 Life Process	3	√		Lectures, Group studies, Independent studies
22	SIK2002	Fundamental Research Skills in Biohealth Science	SIJ1001 Life Process and SIK1001	2		√	Techniques taught include basic lab practice, spectrophotometry, drug analysis, chromatography, nucleic acid extraction, electrophoresis, techniques in the field of parasitology, hematology, physiology, nutrition.

23	SIK2003	General Biochemistry	SIJ1001 Life Process	3	√		Structure and physical characteristic of water; Acid and base, pH and pK; classification, structure and function of carbohydrates lipids, amino acids and proteins; nucleic acids and molecular biology; characteristic of enzyme and the regulation of enzyme activity; the use of enzyme in industries; catabolism and anabolism of carbohydrate, fatty acids, amino acids, nucleic acids .
24	SIK2006	General Human Genetics	SIJ1001 Life Process and SIL1001	3	√		In this course, an integrated approach to learning genetics will be employed encompassing transmission and molecular genetics. Topics include: Cell cycle and cellular division; Mendelian and non-Mendelian inheritance; Chromosome and heredity; Linkage and crossing-over; Genetic mapping; Cytogenetics and the human genome; Human genome stability; Human genetic diseases; Genetic technology applications. Emphasis on human perspectives will be given when discussing the various topics.
25	SIK2008	General Immunology	SIJ1001 Life Process	3		√	This course encompasses basic concepts of immunology which includes specific and non-specific immunity; lymphoid organ / tissues, characteristics and effector functions of leucocytes, mechanisms of the non-specific immunity; humoral and cell-mediated immune reactions; antigens and immunogenicity, types, characteristics and effector functions of antibodies; immunodiagnostic tools; immune diseases
26	SIK2017	Nutrition Science	NIL	3		√	
27	SIL1001	Cell Biology	NIL	2	√	√	This course is divided into three components namely Genetics, Cell Biology and Molecular Biology. Content of each is stated below: i) Genetics: This component comprises of quick introduction of Mendel's Law, the concept of alleles, loci, genes and chromosomes and test crosses. Students will be first refreshed on probability calculations, the Punnet square and linkage&mapping methods. The component will later discusses deeper topics of inheritance which include Extensions to Mendelian Inheritance Concept (Epistasis, Sex linkage), Sex influenced inheritance and Pedigree analyses. At the end of this component students will be exposed to topics such as Human Genetics, Genetic Counselling and finally a brief introduction to Population Genetics and Hardy-Weinberg Equilibrium. ii) Cell Biology This component will discuss on the basic structures and functions of organelles and also processes involving mitosis and meiosis. Students will also be introduced to prokaryotic and eukaryotic cells; and the differences between these two types of cells. iii) Molecular Biology In this component, students will first be refreshed on basic aspects of molecular genetics (Historical account, direct and indirect evidences of DNA as genetic materials, structure and properties of DNA, DNA replication, transcription and translation in prokaryotes and how to decipher genetics codes). The component will later discusses on regulation of gene expression in prokaryotes (lac operon, catabolite repression and trp operon and attenuation), control by sigma factor, anti-termination, post-transcriptional control of RNA (trans- and cis-acting regulators), riboswitch as ribozymes and finally the applications of these knowledge in DNA recombinant technology.
28	SIL2003	Microbial Genetics	SIL1001 Cell Biology	3		√	This introductory course on the genetics of fungi, bacteria, and bacterial viruses will cover theory and techniques related to the study of microbial genetics. Fungal Genetics : Life cycle of Fungi; Genetic crosses; ordered tetrad analysis, unordered tetrad analysis, random ascospores; sexual and parasexual cycle; Formation of Heterokaryon, mitotic recombination; Haploidization. Bacterial Genetics: Organization of bacterial genomes; Recombination in bacteria; Transformation, Conjugation, General and specialised transduction; Mapping of Bacterial genomes. Bacteriophage Genetics: Life cycle of temperate and virulent phages; lysogeny and genetic regulation of life cycle; One step growth experiments; single burst experiments.
29	SIL2008	Molecular Genetics	SIL1001 Cell Biology	3	√		This course includes topics involved in eukaryotic DNA replication, gene transcription and translation. The topics covered: Eukaryotic genome, C-value paradox, histones and non-histone proteins, heterochromatin and euchromatin, classes of DNA, DNA replication in eukaryotes, transcription, RNA polymerases I, II and III, gene regulation in eukaryotes, various control and regulatory elements, pre-mRNA processing and alternative splicing, RNA processing events (rRNA, tRNA, trans-splicing, RNA-editing), posttranscriptional control of gene expression, transcriptional regulation (DNA binding domains), and transcriptional regulation through signal transduction pathway.

30	SIM1001	Basic Mathematics	NIL	4	√	√	<p>Introductory logic. Mathematical statements. Quantifiers. Rules of inference. Mathematical induction, binomial theorem. Sets, Cartesian products, equivalence relations, functions, bijections, inverse functions. Integers, rational numbers, real numbers. Complex numbers. DeMoivre's theorem and roots of unity. Polynomials and equations. Remainder theorem, fundamental theorem of algebra, conjugate roots.</p> <p>Systems of linear equations, row reduction, echelon forms. Matrix operations, algebraic properties of matrices, inverses, elementary matrices, linear independence and homogeneous linear systems, matrices with special forms. Determinants, cofactor expansion, properties of determinants, Cramer's rule, eigenvalues, eigenvectors and diagonalization</p>
31	SIM1002	Calculus I	NIL	4	√	√	<p>Real numbers and real line. Inequality and absolute values. Functions and their graphs. Combining Functions. Limits: Intuitive, limit laws, one-sided limits, limits involving infinity, epsilon-delta definition for limits. Continuity. Derivatives: tangent lines and definition for derivatives. Differentiation Rules including the Chain Rule and implicit differentiation. Rolle's Theorem, The Mean Value Theorem, Maximum, minimum, concavity and points of inflection. Graph sketching. Logarithms, exponential functions. Indeterminate forms and L'Hospital's Rule. Definite and indefinite integrals. Fundamental theorem of Calculus and differentiation of integrals. Integration methods.</p>
32	SIM1003	Calculus II	SIM1002	4	√		<p>Inverses trigonometric functions, hyperbolic functions, inverses of hyperbolic functions. Integration by parts, integration of rational functions by partial fractions, trigonometric integrals, trigonometric substitutions, improper Integrals. Sequence, infinite series, integral test, comparison tests, the ratio and root tests, alternating series test, absolute and conditionally convergence, power series, Taylor and Maclaurin series. Vectors, Dot product, Cross Product and triple Product, lines and planes. Polar coordinates. Cylinder and quadric surfaces.</p> <p>Vector-valued functions and space curves, differentiation and integration of vector valued functions. Functions of several variables, limits and continuity in higher dimensions.</p>
33	SIM2001	Advanced Calculus	SIM1003	4	√		<p>Partial derivatives. Differentiability and continuity. Linearization and differentials. The Chain Rule, Partial derivatives with constrained variables. Directional derivatives. Gradient, divergence and curl. Tangent planes. Taylor's Theorem. Extremum problems of functions of two variables. Lagrange multipliers.</p> <p>Double integrals, iterated integrals and Fubini's Theorem. Applications to areas and volumes. Double integrals in polar form. Triple integrals, iterated integrals. Volumes and masses. Triple integrals in cylindrical and spherical coordinates forms. Substitution in multiple integrals, Jacobians.</p> <p>Basic set theory. Functions, bijective functions, inverse functions. Finite and infinite sets, countable and uncountable sets. The Real Number system. Bounds, supremum and infimum. Archimedean property. Rational and irrational numbers. Properties of real numbers. Sequences of real numbers, convergence. Limit Theorems. Monotone sequences, Cauchy sequences and subsequences. Basic topology of the real line: Open and closed sets, accumulation points</p>
34	SIM2002	Linear Algebra	SIM1001	4	√		<p>Vector spaces and subspaces, basis and dimension, the row space and column space, rank and nullity. Linear transformations, kernel and range, composition and isomorphism, matrix representation, similarity and diagonalizability, Cayley-Hamilton Theorem.</p>
35	SIN1001	Introduction to Computing	NIL	2	√	√	<p>MATLAB - Matlab environment, matrices, constants and variables, operations, built-in functions, formatted output, plotting graphs, expressions and logical data, branches and loops, scripting, user-defined functions. Applications to selected mathematical problems.</p>
36	SIN1002	Introduction to Worksheet	NIL	2	√	√	<p>Basics of Spreadsheet, entering labels, numbers and formulae. Absolute & relative addressing. Excel functions. Graph plotting, use of solvers. Applications to some selected mathematical problems.</p>
37	SIN2001	Mathematical Methods II	SIN1003	4	√		<p>Computer arithmetic: floating-point numbers, round off error, machine precision, overflow/underflow, numerical cancellation, truncation error.</p> <p>Taylor polynomial and limits.</p> <p>Interpolation: Lagrange interpolation, Divided difference method, Hermite interpolation, cubic spline interpolation.</p> <p>Roots of nonlinear equation: bisection method, fixed-point iteration, Newton – Raphson method, secant method.</p> <p>Numerical differentiation: Forward, backward and central finite difference. Numerical Integration: Trapezoidal, Simpson's, Romberg's methods. Composite methods.</p> <p>System of linear equations. Matrix factorization, LU factorization.</p>

38	SIN2002	Structured Programming	SIM1002	4	√		<p>Algorithms: Structured programming – sequence, decision and loops. Object-oriented design.</p> <p>C++ programming: fundamental data types – int, double, char. C++ operators, precedence. Pre-processor directives. In-Built functions. User-defined functions – pass by value, pass by reference. One-dimensional and two-dimensional arrays.</p> <p>Introduction to user-defined data types – structures and classes.</p> <p>Applications to numerical methods: integer- and floating point arithmetic, root-finding, solution of ordinary differential equations. Use of random number generators.</p>
39	SIO2002	Animal Biotechnology	SIJ 1001 Life Process	3		√	Introduction and definition of animal biotechnology in general related to animal reproductivity, artificial insemination techniques in livestock animal, sperm cryopreservation and production and application of vaccines
40	SIO2004	Cell and Tissue Culture	SIJ 1001 Life Process	3		√	Regeneration of complete plants from various cells, tissues and organs from tissue culture system. Media preparation and factors affecting cells, tissues and organs growth and ultimately plant regeneration. Meristem culture and production of diseases free plants. Various types of cultures. Clonal propagation, somatic embryogenesis. Production of haploid and triploid plants. Production of secondary plant metabolites in vitro. Importance and contributions of tissue culture technique. Cryopreservation. Animal tissue culture and biotechnology
41	SIO2010	Post-Harvest Process Engineering and	SIL 1001 Cell Biology	3	√		This is a course designed to expose students to the importance of postharvest biotechnology in understanding horticulture in general. It covers the physiological processes and the use of biotechnology to address postharvest problems. It also gives you an overview of the processes involved from the time of harvest until the time the produce reaches the market
42	SIO2011	Plant Breeding	SIJ 1001 Life Process	3	√		The objective of this course is to introduce the principles of genetic and basic techniques in plant breeding. It covers plant sexual reproduction system, self pollinated and cross pollinated crops, techniques in plant breeding, techniques in breeding for disease resistance and development of hybrid.
43	SIQ2003	Financial Mathematics and Derivatives	SIM1002	4	√		<p>Time Value of Money: simple interest, compound interest, present and accumulated values, nominal rate of interest, force of interest, equation of value.</p> <p>Annuities: annuity immediate, annuity due, perpetuity, m-thly annuity, continuous type annuity, deferred annuities, varying annuities.</p> <p>Instalments: Amortization, sinking funds, amortization with continuous payments.</p> <p>Bonds: Types of bonds, pricing formula, callable and serial bonds, other securities.</p> <p>Cash flows: Discounted cash flows, internal rate of return, money-weighted and time weighted rate of return.</p> <p>Term Structure of Interest Rate: Yield curves, spot and forward rates, duration, convexity, immunization.</p> <p>Introduction to Derivatives: Forward and futures, short and long positions, arbitrage, put and call options, put-call parity, swaps, put-call parity, hedging.</p>
44	SIR2004	General Microbiology	SIJ1001 Life Process	3	√	√	Introduction to Microbiology, concepts and basic techniques of microbiology, evolution, structure and function of the parts of prokaryotic, diversity and importance of microorganisms including archaea, bacteria, fungi and viruses.
45	SIR2009	Microbial Ecology	SIE1001 Biology of Organisms	3	√		Microorganism and ecological theory, microbial population and community dynamics, microorganisms in elemental cycles, microorganisms in natural environments; growth, interaction and adaptation. Molecular microbial ecology.
46	SIS1002	Philosophy of Science and Philosophy of Technology	NIL	3	√	√	In this course, students will be exposed to some of the philosophical schools of science and philosophy of technology with an emphasis on the need to understand the nature of S & T in confronting the issues and challenges of the current world. Subsequently, students will apply theoretical knowledge by doing research on the issues selected via a PBL (Problem Based Learning).
47	SIS2003	Science, Technology and Religion	NIL	3	√	√	This course is designed to explain the separation between science, technology and religion, how secularism that sparked drive industrial revolution and modernism. Today scenario in development of science shows that the dominant world-view need to be fill with value and meaning of life. The application of universal value of religion in life will be explained with the definition of religion, the philosophy of science, technology and it's limitation.

48	SIS2006	Environmental and Sustainability Policy	NIL	3	√	√	Sustainable Development is an important policy concept in the 21st century, influencing policy development to incorporate the long-term balance between economic growth, social welfare and environmental protection. This is a new challenge to technocrats (including scientists and technologists), managers and policy makers who are involved in the problematisation and development of environmental policies. This course will provide basic exposure on how environmental policy can be developed in a more holistic manner, by systematically incorporating the perspective of sustainability in decision making
49	SIT1001	Probability and Statistics I	SIM1002	4	√		<p>Properties of probability. Counting techniques. Conditional probability. Independent events. Bayes Theorem.</p> <p>Discrete random variables. Mathematical Expectation. Discrete distributions: uniform, hypergeometric, Bernoulli, binomial, geometric, negative binomial and Poisson. Moment generating function.</p> <p>Continuous random variables and its mathematical expectation. Continuous distributions: uniform, exponential, gamma, chi-squared and Normal distributions.</p> <p>Distribution of function of one random variable.</p> <p>Sampling distribution theory: Independent random variables. Distributions of sum of independent random variables. Random functions related to the normal distribution. Central limit theorem. Approximation for discrete distributions. Limiting moment generating functions.</p>
50	SIT2001	Probability and Statistics II	SIT1001	4	√		<p>Distributions of two and more dimensional random variables. Correlation coefficient. Conditional distributions. Bivariate normal distribution. Transformation of two random variables. Distributions of order statistics.</p> <p>Biased and unbiased estimators. Method of moment. Method of maximum likelihood. Confidence interval for: mean, proportion and variance of single population; difference between two means, difference between two proportions and ratio of variances.</p> <p>Hypothesis testing for: mean, proportion and variance of single population; difference between two means, difference between two proportions and ratio of variances. Chi-square goodness-of-fit tests and contingency tables.</p> <p>Power of a statistical test. Best critical region. Likelihood ratio test. Chebyshev's inequality. Rao-Cramer's inequality. Convergence in probability and distribution. Asymptotic distribution of maximum likelihood estimator.</p>
51	SIT2002	Further Mathematical Statistics	SIT2001	4		√	The exponential family; sufficient, complete and ancillary statistics; Minimum variance unbiased estimators; Sufficient statistics and best estimators; Bayesian estimation; Delta method for asymptotic approximation; Distributions of special quadratic forms; One and two factors analysis of variance; Linear regression theory and inference of parameters; Correlation analysis in bivariate normal distribution; Sequential probability ratio test
52	SIT2005	Data Analysis I	SIT1001	4	√		<p>Statistical Analysis for mean, variance, count and proportion: Hypothesis testing, confidence interval and tests of independence. Statistical analysis for regression and Correlation: continuous response data, simple and multiple linear model.</p> <p>Statistical tests: Goodness of fit tests, ANOVA, Nonparametric test</p>
53	SIV 2001	Fundamentals of Bioinformatics	SIL 1001 and SIK 1001	3	√		This course aims to give an overview of fundamental concepts in bioinformatics. It covers the utilization of internet biological databases to extract and analyse genomic, proteomic and protein structural data. The importance of ontology in bioinformatics will also be emphasized. Various bioinformatics problems and issues will be discussed on bioinformatics applications.
54	SIV2009	Analysis of Organismal	SIE1001 Organism	2		√	Introduction to systematics and biodiversity, Role and importance of systematics, Concepts and important characteristics of systematics, Discuss the analysis used in phylogenetics. Introduction to the evolutionary concepts and mechanisms. Application of several phylogenetic softwares to reconstruct phylogenetic trees and interpret their relationships.
55	SIX1001	Introduction to Science and Technology Studies	NIL	3	√	√	This course is designed to introduce the students variety of aspect in S&T studies - history, philosophy, sociology, management, policy and economy; case studies in S&T. Students will analyze issues in S&T by using S&T framework – epistemology, ethics, environment, and entrepreneurship; apply variety of disciplines from S&T studies to create local contextual understanding and to apply sustainable S&T intellectually and material. The elements of this course include 1) history of development of S&T in society; 2) critical analysis in science and technology response; 3) effect of S&T in life; 4) initiative in sustainable S&T; and 5) future development of alternative S&T system, vis-à-vis dominant S&T paradigm.

56	SIX1004	Statistics	NIL	3	√		Introduction to statistical analysis. Display and organization of data. Descriptive statistics. Sample and population. Measures of location and dispersion. Possibility and probability. Probability axioms. Probability distributions: Binomial, Poisson and normal. Sampling distributions. Central limit theorem. Estimation, confidence interval and hypothesis testing for mean and proportion. Statistical inference involving two populations. Chi-square tests.
57	SIX1008	Biocomputing	NIL	2	√	√	1) The central dogma of biology 2) The concepts of model and biomolecular representations 3) Sequence and structural databases 4) Sequence analysis 5) Protein structure prediction
58	SIX1010	Earth Ecosystem	NIL	2	√	√	Introduction to the Earth's ecosystems. Factors that influence the Earth's ecosystem. Introduction to the spheres of the Earth (lithosphere, hydrosphere, biosphere and atmosphere). Relationship between the spheres of the earth. Impact of human activities on the earth's ecosystem.