REGULATIONS FOR THE DEGREE OF BACHELOR OF BIOMEDICAL SCIENCES (BBIOMEDSC)

(*See also General Regulations and Regulations for First Degree Curricula*)

Admission to the BBiomedSc Degree

BBMS1 To be eligible for admission to the degree of Bachelor of Biomedical Sciences, candidates shall
(a) comply with the General Regulations;
(b) comply with the Regulations for First degree Curricula; and
(c) satisfy all the requirements of the curriculum in accordance with these regulations and the syllabuses.

Period of study

BBMS2 The curriculum for the degree of Bachelor of Biomedical Sciences shall normally require eight semesters of full-time study, extending over not fewer than four academic years, and shall include any assessment to be held during and/or at the end of each semester. Candidates shall not in any case be permitted to extend their studies beyond the maximum period of registration of six academic years.

Selection of courses

BBMS3 (a) Candidates shall select their courses in accordance with these regulations and the guidelines specified in the syllabuses before the beginning of each semester. Changes to the selection of courses may be made only during the add/drop period of the semester in which the course begins, and such changes shall not be reflected in the transcript of the candidate. Requests for changes after the designated add/drop period of the semester shall not be considered, except under exceptional circumstances as approved by the Board of the Faculty.
(b) Candidates withdrawing from any course without permission after the designated add/drop period of semester shall be given an F grade.

Curriculum requirements

BBMS4 To complete the curriculum, candidates shall
(a) satisfy the requirements prescribed in UG5 of the Regulations for First Degree Curricula; including
(i) 12 credits in English language enhancement, including 6 credits in Core University English[1] and 6 credits in an English in the Discipline course;
(ii) 6 credits in Chinese language enhancement[2]; and

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[1] Candidates who have achieved Level 5** in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent, may at the discretion of the Faculty be exempted from this requirement and should take an elective course in lieu.

[2] Putonghua-speaking candidates must take CUND9002 or CUND9003. Candidates who have not studied the Chinese language during their secondary education or who have not attained the requisite level of competence in the Chinese language to take CEMD9008 Practical Chinese for Biomedical Sciences Students can apply to the Faculty:

(iii) 36 credits of courses in the Common Core Curriculum, selecting not more than one course from the same Area of Inquiry within one academic year and at least one and not more than two courses from each Area of Inquiry;

(b) complete satisfactorily not fewer than 240 units of credits, in the manner specified in these regulations and the syllabuses, including the BBiomedSc major of 96 credits with "BBMS4001 Final Year Project" to be taken in the final year of study as the capstone experience.

BBMS5

(a) Candidates shall normally take not fewer than 24 and not more than 30 credits of courses in each semester (except the summer semester), unless otherwise permitted or required by the Board of the Faculty.

(b) Candidates shall have to satisfactorily complete the prerequisite courses in order to enroll in succeeding courses, unless with exemption granted by the Board of the Faculty.

(c) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, accumulating up to a maximum of 72 credits in one academic year.

Advanced standing

BBMS6

(a) Advanced standing may be granted to candidates who have successfully completed a similar course at other universities or comparable institutions. The amount of credits to be granted for advanced standing shall be determined by the Board of the Faculty, in accordance with UG2 of the Regulations for First Degree Curricula.

(b) Credits granted for advanced standing to a candidate shall not be included in the calculation of his/her cumulative GPA unless permitted by the Board of the Faculty but will be recorded on the transcript of the candidate.

Assessment

BBMS7

(a) Candidates shall be assessed for each of the courses which they have registered for, and assessment may be conducted in any one or any combination of the following manners: written examinations or tests, continuous assessment, laboratory work, project reports, or in any other manner as specified in the syllabuses.

(b) Grades shall be awarded in accordance with UG8(a) of the Regulations for First Degree Curricula.

(c) Written examinations shall normally be held at the end of each semester unless otherwise specified in the syllabuses.

(d) Candidates who are unable, because of illness or other special circumstances, to be present at any examination of a course may apply for permission to present themselves at a supplementary examination of the same course to be held before the beginning of the First Semester of the following academic year. Any such application shall be made on the form prescribed within two weeks of the first day of the candidates' absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.

(e) Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.

(i) to take credit-bearing Cantonese or Putonghua language courses offered by the School of Chinese (especially for international and exchange students), or

(ii) for exemption from Chinese language requirement and take an elective course in lieu.

(f) Candidates are required to make up for failed courses in the following manner:
   (i) undergoing re-assessment/re-examination in the failed course to be held no later than the end of the following semester (not including the summer semester); or
   (ii) re-submitting failed coursework, without having to repeat the same course of instruction; or
   (iii) repeating the failed course by undergoing instruction and satisfying the assessments; or
   (iv) for elective courses, taking another course in lieu and satisfying the assessment requirements.

Discontinuation

BBMS8 Candidates shall normally be recommended for discontinuation of their studies if they have
(a) failed to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters; or
(b) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters (not including the summer semester); or
(c) exceeded the maximum period of registration specified in BBMS2 of the regulations of the degree; or
(d) failed in a core course three times.

Honours classifications

BBMS9 (a) The degree of Bachelor of Biomedical Sciences shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours and Pass. The classification of honours shall be determined by the Board of Examiners for the degree in accordance with the following Cumulative GPA scores, with all courses taken (including failed courses) carrying equal weighting:

Class of honours	*CGPA range*
First Class Honours	3.60 – 4.30
Second Class Honours	(2.40 – 3.59)
Division One	3.00 – 3.59
Division Two	2.40 – 2.99
Third Class Honours	1.70 – 2.39
Pass	1.00 – 1.69

(b) Honours classification may not be determined solely on the basis of a candidate's Cumulative GPA and the Board of Examiners for the degree may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Cumulative GPA falls below the range stipulated in BBMS9(a) of the higher classification by not more than 0.05 Grade Point.

(c) A list of candidates who have successfully completed all degree requirements shall be posted on the Faculty noticeboards.

SYLLABUSES FOR THE DEGREE OF BACHELOR OF BIOMEDICAL SCIENCES (BBIOMEDSC)

Curriculum Structure

1. Courses for Biomedical Sciences Major (96 credits)

   Students are required to complete a total of 96 credits of courses for the Biomedical Sciences major, of which the 4 foundation courses, 2 laboratory courses and the final year project course are prescribed.

   Prescribed courses (48 credits)

   - *Foundation Courses (24 credits)*

		Year	Credits
BBMS1001	Human Biology	1	6
BIOC1600	Perspectives in Biochemistry	1	6
BIOL2102	Biostatistics	1	6
CHEM1042/ CHEM1041	General Chemistry (for students with HKDSE Chemistry)/ Foundations of Chemistry (for students without HKDSE Chemistry)	1	6

   - *Laboratory Courses (12 credits)*

		Year	Credits
BBMS2001	Basic Biomedical Laboratory Techniques	2	6
BBMS3004	Molecular Diagnostics Laboratory	3/4	6

   - *Project Course: Capstone Experience (12 credits)*

		Year	Credits
BBMS4001	Final Year Project	4	12

   Other Courses (48 credits)

   - *Any 4 from List A below:*

   List A

		Year	Credits
BBMS2004	Anatomy	2	6
BPHM1113	Physiology and Pathophysiology I	2	6
BBMS2002	Epidemiology	2	6
BBMS2005	Pharmacology I	2	6
BBMS2003	Human Genetics	2/3	6

   - *Any 4 from List B below:*

   List B

		Year	Credits
BBMS3001	Medical Microbiology	3/4	6
BBMS3002	Molecular Biology of the Cell	3/4	6
BBMS3003	Mechanisms of Diseases	3/4	6
BBMS3005	Infection and Immunity	3/4	6
BIOC3605	Sequence Bioinformatics	3/4	6

2. Common Core Courses (36 credits)

   Students are required to complete 6 Common Core courses (6-credit each) by the end of the second year, selecting not more than one course from the same Area of Inquiry within one academic year and at least one and not more than two courses from each Areas of Inquiry.

3. Language Enhancement Courses (18 credits)

   Students are required to complete 2 English Language courses (6-credit each), including 6 credits of Core University English[1] and 6 credits of English-in-the-Discipline course, and 1 Chinese Language course (6-credit)[2], within the first and second years of the curriculum in accordance with the Regulations for First Degree Curricula of the University.

4. Minors and/or Electives (90 credits)

   Apart from taking the 96 credits of courses for the Biomedical Sciences major as specified in paragraph 1, plus the Common Core courses (36 credits) and the Language Enhancement courses (18 credits), students can plan their study with the remaining credits (i.e. 90 credits) in various manners, subject to time-table constraints and approval of the host faculties. Those interested in enriching and deepening their understanding on topics in the field of biomedical sciences may opt to take a minor and/or electives offered within the BBiomedSc curriculum, while those who would like to broaden their knowledge base outside the realm of biomedical sciences can consider a minor and/or electives offered in other curricula.

   Two minor options are offered in the BBiomedSc curriculum.

   Minor in Genetics & Genomics (36 credits)

		Year	Credits
BIOC1600	Perspectives in Biochemistry	1	6
BIOC2610	Introduction to Molecular Genetics	2	6
BBMS2003	Human Genetics	2/3	6
BIOC3603	Principles of Molecular Genetics	2/3	6
BBMS3006	Public Health Genetics	3/4	6
BBMS3007	Cancer Genetics	3/4	6
BIOC3605	Sequence Bioinformatics	3/4	6
BBMS3008	Essential Proteomics	3/4	6
BBMS3009	Genome Science	3/4	6
BIOC4612	Molecular Biology of the Gene	3/4	6

[1] Candidates who have achieved Level 5** in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent, may at the discretion of the Faculty be exempted from this requirement and should take an elective course in lieu.

[2] Putonghua-speaking candidates must take CUND9002 or CUND9003. Candidates who have not studied the Chinese language during their secondary education or who have not attained the requisite level of competence in the Chinese language to take CEMD9008 Practical Chinese for Biomedical Sciences Students can apply to the Faculty:

(i) to take credit-bearing Cantonese or Putonghua language courses offered by the School of Chinese (especially for international and exchange students), or

(ii) for exemption from Chinese language requirement and take an elective course in lieu.

Minor in Pharmaceutical Sciences (36 credits)

		Year	Credits
BIOC1600	Perspectives in Biochemistry	1	6
BIOC2600	Basic Biochemistry	2	6
BBMS2005	Pharmacology I	2	6
CHEM2441	Organic Chemistry	2	6
BBMS3014	Pharmacology II	3	6
BPHM9142	Molecular Pharmacology	3/4	6
BBMS3016	Biopharmaceutical Discovery & Development	3/4	6
BBMS3015	Advanced Biotechnology & Biopharmaceuticals	3/4	6
BPHM4147	Toxicology and Drug Abuse	3/4	6
BPHM3146	Pharmacology and Therapeutics	3/4	6

There are three courses which are listed under both the BBiomedSc major curriculum and the minor options (BIOC1600 Perspectives in Biochemistry, BBMS2003 Human Genetics and BIOC3605 Sequence Bioinformatics). Students who have taken these three courses for the major will not be allowed to claim credits awarded for the same courses to fulfill the requirements of the minor option.

Electives offered in the curriculum are listed as follows:

		Year	Credits
BBMS3010	Emerging Infections	3/4	6
BBMS3011	Molecular Neuroscience	3/4	6
BBMS3012	Stem Cell & Regenerative Medicine	3/4	6
BBMS3013	Clinical Trial Strategies	3/4	6
BPHM2114	Physiology and Pathophysiology II	3/4	6

Notes:

(1) The minor option Genetics & Genomics is also open to students from other Faculties, and the minimum entry requirement is a pass in BIOC1600 Perspectives in Biochemistry, and any 1 of these courses: BIOC2610 Introduction to Molecular Genetics, BBMS2003 Human Genetics, BIOC3603 Principles of Molecular Genetics.

(2) The minor option Pharmaceutical Sciences is also open to students from other Faculties, and the minimum entry requirement is a pass in BIOC1600 Perspectives in Biochemistry and BPHM2xxx Pharmacology I.

(3) All elective courses may only be offered in alternate years; students should check on course availability and course prerequisites.

COURSE DESCRIPTIONS

Prescribed Courses: Foundation Courses

BBMS1001 Human Biology **Year 1 (6 credits)**

This course examines the concepts related to the structure and function of the human body, including the organization of the body from single cell to the coordinated whole. A major theme is the interaction of all body systems for the maintenance of a stable internal state known as homeostasis. Throughout the course, focus will be placed on the inter-relationship between structure and function in cells, tissues and body systems (integumentary, cardiovascular, respiratory, digestive, urinary, reproductive, musculoskeletal, nervous, hematologic, immune, and endocrine systems). The course serves a basis for understanding the normal processes of life.
Prerequisite: HKDSE Biology or Chemistry or Combined Science with Biology or Chemistry component, or equivalent
Assessment: 40% continuous assessment; 60% examination.

BIOC1600 Perspectives in Biochemistry **Year 1 (6 credits)**

This course aims to give students a biochemical perspective on concepts fundamental to the learning of Biochemistry and to inspire students with a view of the great discoveries and future challenges for Biochemistry. Topics include basic chemistry and biology concepts that are relevant to Biochemistry such as elements, bonding, orbital theory, resonance, biological thermodynamics, molecular structure and conformation, molecular recognition and binding, the basic building blocks of life, the Central Dogma, and evolution.
Prerequisite: HKDSE Biology, Chemistry, or Combined Science with Biology or Chemistry component, or equivalent
Assessment: 40% continuous assessment, 30% outreach project and 30 % test.

BIOL2102 Biostatistics **Year 1 (6 credits)**

To introduce students to experimental design and statistical data analysis at an elementary to intermediate level, with an emphasis on practical applications of statistical methods to experimental and observational data in biology, biochemistry, biomedical sciences, biotechnology, food and nutritional science, ecology and environmental sciences. Students will explore the process by which scientists formulate research questions, set null hypotheses, design experiments, collect data and apply statistics to test the hypotheses.
Prerequisite: BIOC1600 Perspectives in Biochemistry
Assessment: 50% continuous assessment; 50% examination.

CHEM1042 General Chemistry **Year 1 (6 credits)**

The course aims to provide students with a solid foundation of the basic principles and concepts of chemistry. It also provides students with hands-on training of basic laboratory skills and techniques including volumetric analysis, preparation, purification and characterization of chemical substances and some basic instrumental methods. Students will be equipped with a good foundation of theoretical and practical knowledge and skills for further studies in Chemistry.
Prerequisite: Level 3 or above in HKDSE Chemistry
Assessment: 30% continuous assessment; 70% examination.

CHEM1041 Foundations of Chemistry **Year 1 (6 credits)**

The course aims to provide students who do not have HKDSE Chemistry or an equivalent background but are interested in exploring Chemistry further, with an understanding of the essential fundamental principles and concepts of chemistry.
Prerequisite: HKDSE Combined Science with Chemistry component or Integrated Science, or equivalent. Not for students with HKDSE Chemistry.
Assessment: 15% test; 20% assignment; 65% written examination.

Prescribed Courses: Laboratory Courses

Year 2 (6 credits)

BBMS2001 Basic Biomedical Laboratory Techniques

This course aims to give students a general overview of different experimental approaches and to provide students with hands-on experience in basic techniques in biochemical, molecular and biomedical science laboratory. Topics include microscopy, laboratory instrumentation, separation of macromolecules, enzyme and protein analysis, nucleic acid manipulations, molecular cloning, polymerase chain reaction, labeling and detection of macromolecules. Essential concepts of laboratory data management and research integrity will also be introduced.
Prerequisite: Pass in BIOC1600 Perspectives in Biochemistry
Assessment: 50% laboratory assessment; 50% examination.

BBMS3004 Molecular Diagnostics Laboratory **Year 3/4 (6 credits)**

This course introduces students to the principles and applications of molecular diagnostic techniques in patient management. Their role in the diagnosis, prognostication and surveillance of various hereditary conditions, cancers and non-cancer diseases would be presented. Concepts of laboratory management, standardization, quality assurance and safety would be introduced.
Prerequisite: Pass in BBMS2001 Basic Biomedical Laboratory Techniques
Assessment: 60% lab performance; 40% examination.

Prescribed Course: Project Course

BBMS4001 Final Year Project **Year 4 (12 credits)**

The course involves around 300 students' learning hours spreading over 2 semesters. Each student is required to carry out an in-depth study of a specialist field of molecular medicine under the guidance of a supervisor who will provide continuous assessment on the student's performance (20%). The project entails about 100 hours to write up a dissertation (10,000 words) and to give a professional presentation (15–30 minutes), which accounts for 60% and 20% of the final assessment, respectively. The research project also constitutes the capstone experience for the student.
Prerequisite: Pass in BBMS2001 Basic Biomedical Laboratory Techniques and BBMS3004 Molecular Diagnostic Laboratory
Assessment: 40% continuous assessment; 60% dissertation

Language Courses

CAES1000 Core University English **Year 1 (6 credits)**

The Core University English (CUE) course aims to enhance first-year students' academic English language proficiency in the university context. CUE focuses on developing students' academic English language skills for the Common Core Curriculum. These include the language skills needed to understand and produce spoken and written academic texts, express academic ideas and concepts clearly and in a well-structured manner and search for and use academic sources of information in their writing and speaking. Students will also complete four online-learning modules through the Moodle platform on academic grammar, academic vocabulary, citation and referencing skills and understanding and avoiding plagiarism. This course will help students to participate more effectively in their first-year university studies in English, thereby enriching their first-year experience.
Assessment: 60% coursework; 40% examination.

CEMD9008 Practical Chinese for Biomedical Sciences Students **Year 1 (6 credits)**

This course is designed specifically to raise the students' level of proficiency in the use of the Chinese language in the field of biomedical sciences. It aims at sharpening the students' skills both of writing documents (such as letters, brochures, leaflets, reports and proposals) and of effectively interacting with professional practitioners and members of the public in Chinese. There are also drilling practices to familiarize the students with the simplified forms of some basic Chinese biomedical terms.
Assessment: 50% continuous assessment; 20% written examination.

CAES9820 Academic English for Science Students **Year 2 (6 credits)**

This six credit English-in-the-Discipline course will be offered to second year students studying in the Science Faculty. This course will help students develop the necessary skills to use both written and spoken English within their studies. Students will learn to better communicate and spontaneously discuss general and scientific concepts within their division, with other scientists as well as to a larger audience. Particular emphasis will be placed on enabling students to identify their own language needs and develop appropriate self-learning strategies to improve their proficiency.
Assessment: 50% coursework.

Other Courses

BBMS2004 Anatomy **Year 2 (6 credits)**

The course provides an understanding of the organization and functions of human body in relation to clinical practice. Introduction to human anatomy, cell structure, tissues, embryonic differentiation, epithelia, skeletal and articular structures, gastrointestinal system, cardiovascular system, respiratory system, urogenital system, nervous system, endocrine system.
Prerequisite: Level 3 or above in HKDSE Biology or Chemistry or Combined Science with Biology or Chemistry component, or equivalent
Assessment: 30% continuous assessment; 70% examination.

BPHM1113 Physiology and Pathophysiology I **Year 2 (6 credits)**

This course aims to explain the normal functioning of human body and abnormal changes in disease states. Functional significance of cells, organs and systems; homeostasis, membranes, body fluids, cardiovascular system, nervous system, renal system, gastrointestinal system and endocrine system will be discussed.
Prerequisite: Pass in BBMS1001 Human Biology
Assessment: 30% continuous assessment; 70% examination.

BBMS2002 Epidemiology **Year 2 (6 credits)**

Epidemiology is the study of the patterns of health and illness in populations. In the course students will gain a broad understanding of the factors associated with the distribution and determinants of diseases within populations, and the utility of different study designs (cross-sectional studies, cohort studies, case-control studies, randomized controlled trials and outbreak investigation or surveillance studies).
Prerequisite: Pass in BIOL2102 Biostatistics
Assessment: 30% continuous assessment; 70% examination.

BBMS2005 Pharmacology I **Year 2 (6 credits)**

This course provides the necessary information on the interaction of drugs with different body systems, and the pharmacological basis in drug therapy. General principles in pharmacology, drug design and development, pharmacokinetics and pharmacodynamics, drug acting on autonomic nervous system, endocrine system, gastrointestinal system, renal system and cardiovascular system.
Prerequisite: Pass in CHEM1042 General Chemistry or CHEM1041 Foundations of Chemistry
Assessment: 30% continuous assessment; 70% examination.

BBMS2003 Human Genetics **Year 2/3 (6 credits)**

To present an extensive introduction to the principles of genetics, illustrate how they operate in humans with examples, and discuss the applications of these in medical and clinical genetics. Topics include the Mendel's laws of genetics, the basic patterns of Mendelian inheritance in humans, the construction and the analysis of a pedigree, single gene and polygenic inheritance, multifactorial traits and heritability, cytogenetics, karyotypes, structural changes in chromosomes, and non-Mendelian inheritance. Concepts of genetic variations in human populations and Hardy-Weinberg equilibrium will also be presented.
Prerequisite: Pass in BBMS1001 Human Biology or BIOC1600 Perspectives in Biochemistry
Assessment: 30% continuous assessment; 70% examination.

BBMS3001 Medical Microbiology **Year 3/4 (6 credits)**

This course will introduce students to the microbial world by providing general properties of microorganisms including classification, morphologic and growth characteristics, metabolism, genetics and pathogenesis. It will cover aspects of the handling and containment of microorganisms as well as of medical treatment and prevention. Students will explore the applications of microbiology to modern diagnostics, biotechnology and vaccinology.
Prerequisite: Pass in BBMS1001 Human Biology and BBMS2001 Basic Biomedical Laboratory Techniques
Assessment: 30% continuous assessment; 70% examination.

BBMS3002 Molecular Biology of the Cell **Year 3/4 (6 credits)**

The course will provide the foundation knowledge of cells. The concept of cells as basic building units of tissues and body will be introduced. The structure and functions of various cell organelles, cell membrane, receptors and intracellular signaling pathways will be covered. Key cellular process including cellular metabolism, cell cycle regulation, cell death and apoptosis, autophagy, regulation of microRNA will also be introduced.
Prerequisite: Pass in BBMS1001 Human Biology and BBMS2004 Anatomy
Assessment: 30% continuous assessment; 70% examination.

BBMS3003 Mechanisms of Diseases **Year 3/4 (6 credits)**

This course is an introduction to the major pathological mechanisms and their effects underlying important human diseases. These principles would be illustrated by specific examples of human diseases related to infection, inflammation, tissue degeneration, hormonal or metabolic disturbances, autoimmune disorders, cancer, etc. The course would consist of lectures, tutorials and practicals.
Prerequisites: Pass in BBMS1001 Human Biology or BBMS3001 Medical Microbiology
Assessment: 30% continuous assessment; 70% examination.

BBMS3005 Infection and Immunity **Year 3/4 (6 credits)**

This course will introduce students to the host defense by providing basic concepts and different components of immune system including both nonspecific and specific immunity. It will cover aspects of the pathogen-host interaction, immunologic disorders as well as different humoral, cellular and biochemical elements involved in immune responses. Students will explore the applications of immunology to modern diagnostics, biotechnology, therapeutics and disease prevention.
Prerequisite: Pass in BBMS1001 Human Biology and BBMS3001 Medical Microbiology
Assessment: 30% continuous assessment; 70% examination.

BIOC3605 Sequence Bioinformatics **Year 3/4 (6 credits)**

This course will examine existing bioinformatics tools for DNA and protein sequence analysis. The underlying principles of these analysis programs and services will be presented. Students will learn how to retrieve, analyze, and compare protein and DNA sequences using bioinformatics tools available on the World Wide Web.
Prerequisite: Pass in BBMS2003 Human Genetics or BIOC3603 Principles of Molecular Genetics
Assessment: 30% coursework; 70% examination.

Courses for Minor in Genetics & Genomics

BIOC1600 Perspectives in Biochemistry **Year 1 (6 credits)**

To give students a biochemical perspective on each of the Basic Sciences focusing on concepts fundamental to the learning of Biochemistry and to inspire students with a view of the great discoveries and future challenges for Biochemistry. This course also aims to help students make the transition from school to university by developing their independent study skills within a Biochemistry learning environment.
Prerequisite: HKDSE Biology or Chemistry or Combined Science with Biology or Chemistry component, or equivalent
Assessment: 60% coursework, 40% examination.

BIOC2610 Introduction to Molecular Genetics **Year 2 (6 credits)**

The objectives of this course are to provide students with basic and up-to-date knowledge on the structure and functions of nucleic acids, to give students a general picture of the molecular process of gene expression, and to introduce students to recombinant DNA technology. Topics include DNA and chromosome structure, DNA replication, transcription, translation, mutations and DNA repair, and recombinant DNA technology
Prerequisite: Pass in BIOC1600 Perspective in Biochemistry
Assessment: 20% continuous assessment; 80% examination.

BBMS2003 Human Genetics **Year 2/3 (6 credits)**

To present an extensive introduction to the principles of genetics, illustrate how they operate in humans with examples, and discuss the applications of these in medical and clinical genetics. Topics include the Mendel's laws of genetics, the basic patterns of Mendelian inheritance in humans, the construction and the analysis of a pedigree, single gene and polygenic inheritance, multifactorial traits and heritability, cytogenetics, karyotypes, structural changes in chromosomes, and non-Mendelian inheritance. Concepts of genetic variations in human populations and Hardy-Weinberg equilibrium will also be presented.
Prerequisite: Pass in BBMS1001 Human Biology or BIOC1600 Perspectives in Biochemistry
Assessment: 30% continuous assessment; 70% examination.

BIOC3603 Principles of Molecular Genetics **Year 2/3 (6 credits)**

To provide basic knowledge on molecular genetics, illustrating modern concepts with current experimental approaches and computer-assisted programs. Topics include structure and characteristics of prokaryotic and eukaryotic genomes, mechanisms of prokaryotic gene expression controls using bacterial and viral examples; eukaryotic RNA processing, intron splicing and RNA editing mechanisms; mechanisms of homologous recombination, site-specific recombination, and transposition; DNA polymorphisms; molecular cloning strategies and the applications of genetic engineering in basic and applied research.
Prerequisite: Pass in BIOC2600 Basic Biochemistry or BIOC2610 Introduction to Molecular Genetics
Assessment: 20% continuous assessment; 80% examination.

BBMS3006 Public Health Genetics **Year 3/4 (6 credits)**

Public health genetics is the study of variation in the genome, its inheritance, and its contribution to health and disease. The course will centre on an understanding of how genetic and environmental factors work together in determining disease susceptibility in individuals and populations. This course will discuss the use of genetic epidemiology in the study of human diseases, the use of genetic testing in the diagnosis and screening of diseases as well as the use of genetic information in the treatment of diseases. It will also explore the ethical, legal and cultural questions raised such as eugenics, reproductive choice, and genetic discriminations when applying genomics to health care.
Prerequisite: Pass in BBMS2003 Human Genetics
Assessment: 30% continuous assessment; 70% examination.

BBMS3007 Cancer Genetics **Year 3/4 (6 credits)**

The genetic basis of human cancer will be introduced including mechanisms of mutations, the activation of oncogenes, the loss of tumour suppressor genes, and the roles of oncogenes and tumor suppressor genes in the regulation of cell cycle and apoptosis. The genetic basis of predispositions to

cancer will be discussed. The concepts of genomic instability of cancers, linkage analysis, genomic landscape of cancer will also be covered. The epigenetic mechanism including histone modification and DNA methylation in the regulation of gene expression in cancer cells, and the concept of clonal evolution of cancer will also be discussed. The practical applications of cancer genetics including rational cancer therapy will also be introduced.
Prerequisite: Pass in BBMS2003 Human Genetics or BIOC3603 Principles of Molecular Genetics
Assessment: 30% continuous assessment; 70% examination.

BIOC3605 Sequence Bioinformatics **Year 3/4 (6 credits)**

This course will examine existing bioinformatics tools for DNA and protein sequence analysis. The underlying principles of these analysis programs and services will be presented. Students will learn how to retrieve, analyze, and compare protein and DNA sequences using bioinformatics tools available on the World Wide Web.
Prerequisite: Pass in BBMS2003 Human Genetics or BIOC3603 Principles of Molecular Genetics
Assessment: 30% coursework; 70% examination.

BBMS3008 Essential Proteomics **Year 3/4 (6 credits)**

This course will introduce the study of protein structure and the proteome. This will cover the principles of protein structure, protein structure classification and identification, structure determination by X-ray crystallography and NMR, modelling of protein structure, protein-protein interaction, separation and analysis of protein, and mass spectrometry analysis of proteome.
Prerequisite: Pass in BIOC3605 Sequence Bioinformatics or BIOC2600 Basic Biochemistry or BIOL3404 Protein Structure and Function
Assessment: 30% assignment; 70% examination.

BBMS3009 Genome Science **Year 3/4 (6 credits)**

This course will present topics applicable to genomic biology and the "post-genome" phase of molecular biology. Main topics include genome-scale sequencing, analysis of genetic variations and gene expression profiling. Recent progresses in the Human Genome Project, the HapMap Project, linkage disequilibrium, linkage analysis, genome-wide association studies, and functional genomics will be presented. Experimental methods in genome science including gene mapping, DNA sequencing, next-generation genome sequencing, SNP genotyping, gene chips and other array technologies for transcriptome profiling will also be covered. Student will be familiar with genomics that will be useful in their future career, be it in science or industry.
Prerequisite: Pass in BBMS2003 Human Genetics or BIOC3603 Principles of Molecular Genetics
Assessment: 20% assignment; 80% examination.

BIOC4612 Molecular Biology of the Gene **Year 3/4 (6 credits)**

This course aims to provide an up-to-date knowledge of molecular biology, especially with respect to the regulation of eukaryotic gene expression and molecular embryology. These are essential for the understanding of normal development and diseases. Topics include structure and assembly of transcription factors, the mechanisms of transcriptional activation and initiation, DNA sequence elements in control of gene expression, locus control region, genomic imprinting, chromatin remodeling by histone modifications, splicing factors, RNA processing and transport, regulation of translation, regulation of gene expression in cell stress response, and gene expression during development.
Prerequisite: Pass in BIOC3603 Principles of Molecular Genetics
Assessment: 20% assignment; 80% examination.

Courses for Minor in Pharmaceutical Sciences

BIOC1600 Perspectives in Biochemistry **Year 1 (6 credits)**

To give students a biochemical perspective on each of the Basic Sciences focusing on concepts fundamental to the learning of Biochemistry and to inspire students with a view of the great discoveries and future challenges for Biochemistry. This course also aims to help students make the transition from school to university by developing their independent study skills within a Biochemistry learning environment.
Prerequisite: HKDSE Biology or Chemistry or Combined Science with Biology or Chemistry component, or equivalent
Assessment: 60% coursework, 40% examination.

BIOC2600 Basic Biochemistry **Year 2 (6 credits)**

This course gives an understanding of the chemical and molecular aspects of biological processes, including the chemistry of biomolecules, enzymology, bioenergy, biochemical control mechanisms and molecular genetics. Introduction to cell biochemistry, cells replication, cell death, biochemistry of diseases, effects of drug therapy on metabolic biochemistry and cellular functions, biotechnology and its application in the development of biopharmaceuticals.
Prerequisite: Prerequisite: BIOC1600 Perspectives in Biochemistry
Assessment: 30% continuous assessment; 70% examination

BBMS2005 Pharmacology I **Year 2 (6 credits)**

This course provides the necessary information on the interaction of drugs with different body systems, and the pharmacological basis in drug therapy. General principles in pharmacology, drug design and development, pharmacokinetics and pharmacodynamics, drug acting on autonomic nervous system, endocrine system, gastrointestinal system, renal system and cardiovascular system.
Prerequisite: Pass in CHEM1041 Foundations of Chemistry or CHEM1042 General Chemistry
Assessment: 30% continuous assessment; 70% examination.

CHEM2441 Organic Chemistry **Year 2 (6 credits)**

To give students a basic understanding of organic chemistry, especially in the context of daily life. This will be achieved through the introduction of the chemistry of organic functional groups that form the basis of organic molecules. The concepts presented in the lectures will be reinforced by a series of laboratory experiments.
Prerequisite: Pass in CHEM1042 General Chemistry
Assessment: 30% assignment; 70% examination.

BBMS3014 Pharmacology II **Year 3 (6 credits)**

This course provides information on the mechanisms of drug used in the treatment of various disease conditions. Drugs acting on the central nervous system, musculoskeletal system, immune system, haematology system, respiratory system and reproductive system.
Prerequisite: Pass in BBMS2005 Pharmacology I
Assessment: 30% continuous assessment; 70% examination.

BPHM9142 Molecular Pharmacology **Year 3/4 (6 credits)**

This course examines the molecular basis of drug interaction with the cell and explores how cutting edge biotechnology and biomedical research can advance pharmacological knowledge, hence improving students' understanding of how drugs work. The structure of the course is divided into 4 main themes: (i) advanced knowledge on gene, protein and cells as drug targets; (ii) cutting-edge technologies in pharmacology and drug discovery; (iii) molecular pharmacology of receptors, channels and enzymes; (iv) signal transduction and modulation. A special topic will be selected each year to review updated drug development and news in a particular field.
Prerequisite: Pass in BBMS2005 Pharmacology I
Assessment: 30% assignment; 70% examination.

BBMS3016 Biopharmaceutical Discovery & Development **Year 3/4 (6 credits)**

This course introduces the key steps in the drug discovery process, the clinical development and testing of new therapeutic agents, and the appropriate way to produce them on an industrial scale. Existing, novel and potential therapeutic targets; structure-based drug discovery, development of high-throughput screening assay, impact of structural proteomics on drug discovery and development will also be explored.
Prerequisite: Pass in BBMS2005 Pharmacology I
Assessment: 30% assignment; 70% examination.

BBMS3015 Advanced Biotechnology & Biopharmaceuticals **Year 3/4 (6 credits)**

The course is designed to give students a detailed insight into techniques in biopharmaceutical discovery, isolation and characterization, and introduces commonly used biotech manufacturing processes for therapeutic antibodies and proteins, including genetic engineering, cell culture and fermentation; harvest and recovery; viral removal and inactivation; and purification processes. The practical work includes production of a model recombinant biopharmaceutical by cell culture, including downstream processing and characterization using modern techniques analytical biotechnology including mass spectrometry.
Prerequisite: Pass in BBMS2005 Pharmacology I
Assessment: 30% assignment; 70% examination.

BPHM4147 Toxicology and Drug Abuse **Year 3/4 (6 credits)**

This course provides students with an understanding of the toxicological problems encountered in clinical practice, drug development and medical research. Introduction to the biotransformation and toxicity of drugs, carcinogenicity, drug addiction and withdrawal syndrome; physiological, pharmacological and sociological consequences of drug abuse; treatment regimens of drug abuse.
Prerequisite: Pass in BBMS3014 Pharmacology II
Assessment: 30% continuous assessment; 70% examination.

BPHM3146 Pharmacology and Therapeutics **Year 3/4 (6 credits)**

This course presents information on the use of drugs in the extreme of age, as well as drugs for local application. Neonatal, pediatric and geriatric pharmacology; ear, eye and nose medications; drugs used in dermatology, chemotherapy, radiopharmaceuticals, critical care, women's health, nutrition.
Prerequisite: Pass in BBMS3014 Pharmacology II
Assessment: 30% continuous assessment; 70% examination.

Elective Courses

BBMS3010 Emerging Infections **Year 3/4 (6 credits)**

This course will introduce students to the comparative human/animal infections and diseases with emphasis on zoonotic viral infections. The course investigates the pathogenesis of microbes of recent concern, focusing on the particularly innovative molecular processes these organisms use to ensure their success in surviving and multiplying in the human host. It also provides new insights into the phylogenetic relationships between microorganisms based on molecular systematics as well as into the latest issues of pathogenesis, pandemic, prevention and eradication.
Prerequisite: Pass in BBMS3005 Infection and Immunity or BBMS3001 Medical Microbiology
Assessment: 30% continuous assessment; 70% examination.

BBMS3011 Molecular Neuroscience **Year 3/4 (6 credits)**

This course provides an interdisciplinary introduction to fundamental aspects of the structure and function of the nervous system. The topics to be covered include the properties of nerve and glial cells, the ionic and molecular basis of neural excitability, synaptic transmission and plasticity, signal transduction, as well as neural network for brain functions, such as perception, motor control, cognition, dementia, and emotional disturbance.
Prerequisite: Pass in BBMS3002 Molecular Biology of the Cell
Assessment: 30% continuous assessment; 70% examination.

BBMS3012 Stem Cell & Regenerative Medicine **Year 3/4 (6 credits)**

Numerous human diseases resulting from the loss or malfunction of highly specialized cell types are currently incurable due to lack of capacity to regenerate due to diseases, traumas or aging. Recent advances in stem cell research have enabled clinicians and researchers to pursue for the first time revolutionary treatment paradigms based on regenerating human cells. In this course, a comprehensive introduction of the biology of stem cells, tissue engineering, industrial and clinical applications, bioethics, historical and political developments will be given. Upon completion, students should have a global perspective of the emerging field of Stem Cell & Regenerative Medicine that bounds to revolutionize how medicine will be practiced.
Prerequisite: Pass in BBMS3002 Molecular Biology of the Cell
Assessment: 30% continuous assessment; 70% examination.

BBMS3013 Clinical Trial Strategies **Year 3/4 (6 credits)**

This course will discuss the history of clinical trials, as well as the history of research ethics in clinical trials. The main features of clinical trials will be highlighted including trial guidelines, research ethics practice; responsibility and liability; quality assurance, audits and Good Clinical Practice (GCP); documentation and study monitoring. Clinical data management; and protocol development will also be featured.
Prerequisite: Pass in BIOL2102 Biostatistics and BBMS2002 Epidemiology
Assessment: 30% continuous assessment; 70% examination.

BPHM2114 Physiology and Pathophysiology II **Year 3/4 (6 credits)**

This course provides information on the normal functioning of various body systems and the presentations in disease states. Physiology and pathophysiology of central nervous system, musculoskeletal system, haematology and immune systems, respiratory system, urogenital system and reproductive system; metabolic rate, body temperature regulation.
Prerequisite: Pass in BPHM1113 Physiology and Pathophysiology I
Assessment: 30% continuous assessment; 70% examination.