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

These regulations are applicable for candidates admitted under the 4-year BBiomedSc curriculum in the academic year 2019-20 to 2023-24.
(*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];

[1] Candidates who have achieved Level 5 or above in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent, are exempted from this requirement, and Core University English is optional. Those who do not take this course should take an elective course in lieu, see Regulation UG6.

[2] Students are required to successfully complete the 6-credit Faculty-specific Chinese language enhancement course, except for:
(a) Putonghua-speaking students who should take CUND9002 Practical Chinese and Hong Kong Society or CUND9003 Cantonese for Non-Cantonese Speaking Students; and
(b) students who have not studied 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 should write to the Faculty Board to apply to be exempted from the Chinese language requirement, and
(i) take a 6-credit Cantonese or Putonghua language course offered by the School of Chinese especially for international and exchange students; OR
(ii) take an elective course in lieu.

(iii) 36 credits of courses in the Common Core Curriculum comprising at least one and not more than two courses from each Area of Inquiry with not more than 24 credits of courses being selected within one academic year except where candidates are required to make up for failed credits; and
(iv) successful completion of any other non-credit bearing courses as required;

(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" or "BBMS4012 Innovation Team 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 the 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 seven calendar days 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.
(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 Graduation GPA scores (GGPA), with all courses taken (including failed courses) carrying weightings which are proportionate to their credit values[3]:

Class of honours	*GGPA 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 Graduation 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 Graduation GPA falls below the range stipulated in BBMS9(a) of the higher classification by not more than 0.1 Grade Point.

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

[3] For students in the 2017-18 intake and thereafter who have successfully completed six Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five Common Core courses with the highest grades (covering all four Areas of Inquiry), or all six courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA.

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

These syllabuses are applicable for candidates admitted under the 4-year BBiomedSc curriculum in the academic year 2023-2024.

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	Introduction to Human Anatomy and Physiology	1	6
BBMS1003	Perspectives in Biochemistry	1	6
CHEM1042/ CHEM1041	General Chemistry I (for students with HKDSE Chemistry)/ Foundations of Chemistry (for students without HKDSE Chemistry)	1	6
BBMS2013	Biomedical Statistics	2	6

   - *Laboratory Courses (12 credits)*

		Year	Credits
BBMS1011	Fundamental Biomedical Laboratory Techniques	1	6
BBMS3004	Molecular Diagnostics Laboratory	2/3/4	6

   - *Project: Capstone Experience (12 credits) - Any 1 from the list below*

		Year	Credits
BBMS4001	Final Year Project	4	12
BBMS4012	Innovation Team Project	4	12

   Disciplinary Elective Courses (48 credits)

   - *Any 4 from List A below:*

   List A

		Year	Credits
BBMS2004	Human Anatomy	2	6
BBMS2005	Biomedical Pharmacology	2	6
BBMS2006	Physiological Basis of Health and Disease	2	6
BBMS2007	Essential Molecular Biology	2	6
BBMS2009	Introduction to Clinical Research	2	6
EXSC2003	Exercise Physiology	1/2/3/4	6
BBMS2003	Human Genetics	2/3	6
BBMS2010	Fundamentals of Clinical Trial Management	2/3	6
BBMS2011	Research Methods in Medicine and Health Sciences	2/3	6
EXSC2008	Physical and Health Benefits of Exercise	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 and Pathology of Diseases	3/4	6
BBMS3005	Infection and Immunity	3/4	6
BBMS3007	Cancer Biology	3/4	6
BBMS3008	Essential Proteomics	3/4	6
BBMS3009	Genome Science	3/4	6
BBMS3010	Emerging Infections	3/4	6
BBMS3011	Molecular Neuroscience	3/4	6
BBMS3012	Stem Cell Biotechnologies in Regenerative Medicine	3/4	6
BBMS3018	Biomechanics and Biomedical Technologies	3/4	6
BBMS3019	Topographic Anatomy and Anatomy Education	3/4	6
BBMS4003	Developmental Genetics	3/4	6
BBMS4005	Biopharmaceutical Research and Development	3/4	6
BIOC3605	Sequence Bioinformatics	3/4	6
BIOC4612	Molecular Biology of the Gene	3/4	6
EXSC3014	Rehabilitation Science	1/2/3/4	6
EXSC3018	Biological Basis of Exercise and Health	1/2/3/4	6
EXSC3019	Exercise and Chronic Diseases	1/2/3/4	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, comprising at least one and not more than two courses from each Area of Inquiry with not more than 24 credits of courses being selected within one academic year except where candidates are required to make up for failed credits.

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

[1] Candidates who have achieved Level 5 or above in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent, are exempted from this requirement, and Core University English is optional. Those who do not take this course should take an elective course in lieu, see Regulation UG6.

[2] Students are required to successfully complete the 6-credit Faculty-specific Chinese language enhancement course, except for:

(a) Putonghua-speaking students who should take CUND9002 Practical Chinese and Hong Kong Society or CUND9003 Cantonese for Non-Cantonese Speaking Students; and

(b) students who have not studied 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 should write to the Faculty Board to apply to be exempted from the Chinese language requirement, and

   (i) take a 6-credit Cantonese or Putonghua language course offered by the School of Chinese especially for international and exchange students; OR

   (ii) take an elective course in lieu.

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.

Three minor options are offered in the BBiomedSc curriculum.

Minor in Biotechnology & Clinical Research (36 credits)

		Year	Credits
BBMS1001	Introduction to Human Anatomy and Physiology	1	6
BBMS2005	Biomedical Pharmacology	2	6
BBMS2009	Introduction to Clinical Research	2	6
BBMS2008	Contemporary Topics in Biomedical Technology	2/3	6
BBMS2010	Fundamentals of Clinical Trial Management	2/3	6
BBMS3012	Stem Cell Biotechnologies in Regenerative Medicine	3/4	6
BBMS3018	Biomechanics and Biomedical Technologies	3/4	6
BIOL2409	Biotechnology Industry and Entrepreneurship	2/3/4	6
BBMS4005	Biopharmaceutical Research and Development	3/4	6
BMED4604	Cell and Tissue Engineering	3/4	6

Minor in Genetics & Genomics (36 credits)

		Year	Credits
BBMS1003/ BIOC1600	Perspectives in Biochemistry	1	6
BBMS2007	Essential Molecular Biology	2	6
BBMS2003	Human Genetics	2/3	6
BBMS3007	Cancer Biology	3/4	6
BBMS3008	Essential Proteomics	3/4	6
BBMS3009	Genome Science	3/4	6
BBMS4003	Developmental Genetics	3/4	6
BIOC3605	Sequence Bioinformatics	3/4	6
BIOC4612	Molecular Biology of the Gene	3/4	6
BBMS4004	Public Health Genetics	3/4	6
BIOF3002	Genome Sequencing and Analysis	3/4	6

Minor in Kinesiology (36 credits)

		Year	Credits
BBMS1001	Introduction to Human Anatomy and Physiology	1	6
EXSC2003	Exercise Physiology	1/2/3/4	6
EXSC2007	Exercise Prescription and Training	2	6
EXSC2008	Physical and Health Benefits of Exercise	2/3	6
EXSC2009	Exercise Biomechanics	1/2/3/4	6
EXSC2010	Measurement and Evaluation of Physical Activity	1/2/3/4	6
BBMS3018	Biomechanics and Biomedical Technologies	3/4	6
EXSC3017	Nutrition for Exercise and Health	3/4	6
EXSC3018	Biological Basis of Exercise and Health	1/2/3/4	6
EXSC3019	Exercise and Chronic Diseases	1/2/3/4	6

Students who have taken the course(s) for the major will not be allowed to claim credits awarded for the same courses to fulfil the requirements of the minor option.

5. Non-credit bearing course

   Students are required to complete and pass the non-credit bearing course “UG5E1001 Introduction to the Constitution, the Basic Law and the National Security Law” under Regulation UG5(e) of the Regulations for First Degree Curricula.

COURSE DESCRIPTIONS

Prescribed Courses: Foundation Courses

BBMS1001 Introduction to Human Anatomy and Physiology Year 1 (6 credits)

This course examines the concepts related to the structure and function of the human body, including the organisation of the body from single cell to the coordinated whole. Throughout the course, focus will be placed on the inter-relationship between structure and function in cells, tissues and body systems (cardiovascular, respiratory, digestive, renal, musculoskeletal, neural, 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: 50% continuous assessment; 50% examination.

BBMS1003 Perspectives in Biochemistry Year 1 (6 credits)

This course aims to:
- Teach students a biochemical perspective on each of the Basic Sciences focusing on concepts fundamental to the learning of Biochemistry.
- Promote deep learning of course material through an integrated programme of practical and collaborative tasks.
- Inspire students with a view of the great discoveries and future challenges for Biochemistry.
- Help students make the transition from school to university by developing their teamwork, independent study skills and confidence to communicate within a Biochemistry learning environment.

Prerequisite: Level 3 or above in HKDSE Biology, Chemistry, or Combined Science with Biology or Chemistry component, or equivalent.
Assessment: 50% continuous assessment; 50% examination.

Remark: Not for students who have passed or are enrolled in BIOL1110 From Molecules to Cells or BIOC1600 Perspectives in Biochemistry.

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: Level 3 or above in HKDSE Combined Science with Chemistry Component or Integrated Science, or equivalent.
Students without such background may approach the course coordinator for consideration.
Assessment: 30% assignments; 50% examination; 20% test.
Remark: Not for students with Level 3 or above in HKDSE Chemistry or having taken any level 1 Chemistry course or above or any equivalent Chemistry course.

CHEM1042 General Chemistry I 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 or equivalent, or pass in CHEM1041 Foundations of Chemistry.

Assessment: 20% test; 30% lab reports; 50% examination.
Remark: Not for students having taken any level 1 Chemistry course (except for CHEM1041 Foundations of Chemistry) or above or any equivalent Chemistry course.

BBMS2013 Biomedical Statistics **Year 2 (6 credits)**

The ability to understand the fundamentals of biostatistics, and to employ appropriate quantitative methods to analyze data generated from diverse types of biomedical studies is a necessary requirement for biomedical and bioinformatics students. This course aims to introduce students to the central principles and concepts of statistical analysis, with special attention to analytical approaches typically encountered in biomedical sciences research. The first part of the course will cover some basic biostatistical knowledge (distributions, estimation, hypothesis testing), as well as some more advanced applications (regression and correlation analysis, multivariate statistics). The second part of the course will give students the practical skills and knowledge to apply the concepts learnt on real-life data analyses using R, a statistical programming language.
Prerequisite: Pass in BBMS1003/BIOC1600 Perspectives in Biochemistry.
Assessment: 70% continuous assessment; 30% examination.
Remark: Not for students who have successfully completed or are enrolled in BIOF2013 Biomedical Statistics (Bioinformatics).

Prescribed Courses: Laboratory Courses

BBMS1011 Fundamental Biomedical Laboratory Techniques **Year 1 (6 credits)**

This course aims to give students a general overview of different experimental approaches and to provide students with hands-on experience in fundamental 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, labelling and detection of macromolecules. Essential concepts of laboratory data management and research integrity will also be introduced.
Assessment: 50% laboratory assessment; 50% examination.

BBMS3004 Molecular Diagnostics Laboratory **Year 2/3/4 (6 credits)**

This course introduces students to the principles and applications of molecular diagnostic techniques in patient management. Their roles in the diagnosis, prognostication, therapy and surveillance of various hereditary conditions, cancers and non-cancer diseases would be discussed. Concepts of laboratory management, standardisation, quality assurance and safety would be introduced.
Prerequisite: Pass in BBMS1011 Fundamental Biomedical Laboratory Techniques or BBMS2001 Basic Biomedical Laboratory Techniques.
Assessment: 50% continuous assessment; 50% examination.

Prescribed Course: Project

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 specialised field of biomedical science and molecular medicine under the guidance of a supervisor who will provide continuous assessment on the student's performance (15%). The project entails about 100 hours to write up a literature review (3,000 words)

to be incorporated into a dissertation (10,000 words), and to give a professional presentation (20 minutes). The literature review, the dissertation and the oral presentation account for 15%, 45% and 25% of the final assessment, respectively. The research project also constitutes the capstone experience for the student.
Prerequisite: Pass in BBMS1011 Fundamental Biomedical Laboratory Techniques or BBMS2001 Basic Biomedical Laboratory Techniques.
Co-requisite: Pass in BBMS3004 Molecular Diagnostics Laboratory.
Assessment: 15% continuous assessment; 25% oral presentation; 15% literature review; 45% dissertation.
Remark: Not for students who have enrolled in BBMS4012 Innovation Team Project.

BBMS4012 Innovation Team Project **Year 4 (12 credits)**

This course will simulate real-life pre-seed start-up accelerator programmes. It will walk students through the complete process of setting up a biomedical technology-based start-up company. Across the two semesters, the students will be asked to: (1) identify potential biomedical research outputs for translation into a product, (2) work on their ideas, (3) identify different types of talents they would potentially recruit to build the team, (4) name the company and product and (5) work out a business model. The curriculum will cover topics from evaluating biomedical research output for translation into viable products to the intricacies of setting up a company.
Assessment: 100% continuous assessment.
Remark: Not for students who have passed BBMS4011 Biomedical Innovation Team Project or have enrolled in BBMS4001 Final Year Project.

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. Four online-learning modules through the Moodle platform on academic speaking, academic grammar, academic vocabulary, citation and referencing skills and avoiding plagiarism will be offered to students to support their English learning. This course will help students to participate more effectively in their first-year university studies in English, thereby enriching their first-year experience.
Assessment: 100% continuous assessment.

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

The main objective of this course is to promote the professional use of Modern Chinese Language in the field of biomedical sciences. The course will familiarize students with traditional and simplified Chinese characters, correction of wrongly written characters, modern Chinese grammar and rhetoric and practical Chinese writings through outcome-based and communication-rich assignments and an examination. Special training about communication (e.g. lecture, tutorial, training workshop) that is intended to sharpen students' presentation skills will also be provided.
Assessment: 50% continuous assessment; 50% examination.

CAES9722 Academic English for Biomedical Sciences Students **Year 2 (6 credits)**

This six credit English-in-the-Discipline course is offered to second year students studying Biomedical Sciences. It helps students develop the necessary skills to use both written and spoken English within their studies and beyond. Students will learn to better communicate and discuss

scientific concepts with other biomedical scientists as well as to a wider audience. In the writing component, students will learn how to disseminate recent scientific research in the form of a popular science article as well as a wiki article for a novice scientist audience. In the speaking component, students will present information from their research in an oral presentation format.
Assessment: 100% continuous assessment.

Disciplinary Elective Courses: List A

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

The course provides an understanding of the organisation, structure and functions of the human body. The course covers embryonic differentiation, musculoskeletal structures, brain and spinal cord, cardiovascular system, respiratory system, gastrointestinal system, endocrine system, and the urogenital system.
Prerequisite: Level 3 or above in HKDSE Biology or Chemistry or Combined Science with Biology or Chemistry component, or equivalent and Pass in BBMS1001 Introduction to Human Anatomy and Physiology.
Assessment: 50% continuous assessment; 50% examination.

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

This course provides basic information on the general principles in pharmacology, pharmacokinetics, pharmacodynamics and pharmacogenomics. The interaction of drugs with different body systems will also be covered. In addition, commonly used anti-microbial, anti-inflammatory and anti-cancer drugs will be introduced. This knowledge is highly relevant and applicable to clinical trial and biotechnology-related drug research.
Prerequisite: Pass in CHEM1042 General Chemistry I or CHEM1041 Foundations of Chemistry.
Assessment: 50% continuous assessment; 50% examination.

BBMS2006 Physiological Basis of Health and Disease **Year 2 (6 credits)**

This course examines the concepts related to the physiological functions of the human body and their pathophysiological changes under disease conditions. The focus throughout the course will be on the physiological systems, namely digestive, cardiovascular, respiratory, neural, endocrine and renal systems. The course serves as a knowledge basis for understanding the functions of the human body in normal and disease states.
Prerequisite: Pass in BBMS1001 Introduction to Human Anatomy and Physiology.
Assessment: 50% continuous assessment; 50% examination.

BBMS2007 Essential Molecular Biology **Year 2 (6 credits)**

This course aims to enable the students to understand the basics in molecular biology including the process and machineries involving in the storage, utilisation and maintenance of the genetic information and the corresponding genomes.
Prerequisite: Pass in BBMS1003/BIOC1600 Perspectives in Biochemistry, BMED1207 Fundamentals of Chemistry and Biology for Biomedical Engineering or BIOL1110 From Molecules to Cells.
Assessment: 60% continuous assessment; 40% examination.
Remark: Not for students who have passed BIOL3401 Molecular Biology, or have already enrolled in this course.

BBMS2009 Introduction to Clinical Research **Year 2 (6 credits)**

The purpose of clinical research is to determine the safety and efficacy of treatments intended for human use. It helps researchers to learn how to prevent, diagnose and treat human illness. Clinical

Trial is a key type of clinical research. The aim of this course is to equip students with necessary knowledge and skills for planning, designing and conducting clinical trials. The overall course learning outcome is to build a strong understanding of the scientific, practical, and ethical aspects of clinical trials.
Prerequisite: Pass in any one of the following courses: BIOF1001 Introduction to Biomedical Data Science, BBMS2013 Biomedical Statistics, BIOL2102 Biostatistics, MATH1013 University Mathematics II, MATH1853 Linear Algebra, Probability and Statistics, STAT1601 Elementary Statistical Methods, STAT1603 Introductory Statistics or concurrently enrolled in BBMS2013 Biomedical Statistics.
Assessment: 100% continuous assessment.

EXSC2003 Exercise Physiology Year 1/2/3/4 (6 credits)

This course will introduce the key physiological and metabolic responses to acute and chronic exercise. Students will examine and evaluate physiological changes that occur to respiratory, cardiovascular and musculoskeletal systems during an acute bout of exercise and following a period of exercise training. The physiological basis of anaerobic and aerobic training and muscle training will be discussed. The environmental factors such as temperature and altitude that affect the responses to exercise will also be discussed. Students will participate in practical sessions held in the exercise physiology laboratory to assess their own anaerobic power and aerobic capacity.
Assessment: 100% coursework.

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 covered include Mendel's laws of genetics, basic patterns of Mendelian inheritance in humans, the construction and analysis of pedigrees, 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 Introduction to Human Anatomy and Physiology; BBMS1003/BIOC1600 Perspectives in Biochemistry or BIOL1110 From Molecules to Cells.
Assessment: 50% continuous assessment; 50% examination.

BBMS2010 Fundamentals of Clinical Trial Management Year 2/3 (6 credits)

Clinical trial management, an essential aspect of clinical trials, is critical to the reliability and acceptability of drug, technology, or clinical intervention trials. Good clinical practice (GCP) refers to a set of international quality standards that defines the processes and regulations under which clinical trials on human subject's function. This course is designed to explain GCP and prepare students with skills in the conduct and management of clinical trials based on GCP and other regulatory requirements. The course is also integral to preparing students for a career in clinical trial research and management.
Assessment: 100% continuous assessment.

BBMS2011 Research Methods in Medicine and Health Sciences Year 2/3 (6 credits)

This course introduces students to a comprehensive set of knowledge and practical skills necessary for understanding, appraising, and conducting clinical research. Students will start by examining the epistemological basis of scientific inquiry and its evolution, and begin formulating relevant research questions within a causal framework. Students will then be introduced to different approaches to answer research questions, including major epidemiologic study designs and qualitative research methods, and will learn about important considerations when conducting research, including research ethics, survey design, and data management & analysis. Finally, students will apply and transfer the knowledge of conducting research and interpreting and communicating results from research studies.

Assessment: 50% continuous assessment; 50% examination.

EXSC2008 Physical and Health Benefits of Exercise Year 2/3 (6 credits)

This course will investigate the role of exercise, physical activity (PA), inactivity and sedentary behaviour in health and wellness, with particular emphasis on the role of exercise and physical activity in the prevention and treatment of major non-communicable diseases (NCDs). Key terms relating to PA will be defined. Various PA measurement methods and their use in PA epidemiology and public health research will be discussed. Students will learn about fundamental study designs and methodologies used in evaluating the impacts of PA on health. Students will obtain skills and knowledge necessary to critically evaluate evidence on health benefits of PA. Students will learn whether the beneficial impacts of PA on health outcomes are independent of, or modified by other health risk factors, such as obesity, sedentary behaviour and genetic risk.
Assessment: 100% coursework.

Disciplinary Elective Courses: List B

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 Introduction to Human Anatomy and Physiology and pass in any one of the following courses: BBMS1011 Fundamental Biomedical Laboratory Techniques, BBMS2001 Basic Biomedical Laboratory Techniques.
Assessment: 50% continuous assessment; 50% examination.

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

The course will cover current topics of cell biology and will provide an overview of the fundamentals of biological processes that contribute to cell growth and survival. Four major areas will be covered: Nucleus and Epigenetics; Signal Transduction; Cytoskeleton and Cell Adhesion; and Cell Proliferation and Differentiation. Students will also be introduced to current methodologies for molecular and cell biology research, and will be exposed to emerging systems and synthetic biology approaches in the study of cellular processes. The course also aims to provoke appreciation of how knowledge in basic science aids in the detection, rationalisation and treatment of genetic diseases, including cancer and other metabolic disorders. Students are expected to research into how good understanding of the basic principles of molecular and cell biology has facilitated development of current strategies for disease intervention.
Prerequisites: Pass in BBMS1001 Introduction to Human Anatomy and Physiology and pass in any one of the following courses: BBMS1011 Fundamental Biomedical Laboratory Techniques, BBMS2001 Basic Biomedical Laboratory Techniques.
Assessment: 50% continuous assessment; 50% examination.

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

This course aims to introduce the causes, pathogenesis and pathologies of common human diseases related to inflammation and immune reactions. They include diseases due to acute & chronic inflammation caused by infections, toxic insults and immunologic damages. Principles of diseases related to autoimmunity, organ transplantation and malignancies of haematolymphoid organs are also included. The course consists of lectures and practicals. The latter includes examination of human pathology specimens affected by inflammatory and infective conditions.

Prerequisites: Pass in BBMS2004 Human Anatomy and BBMS2006 Physiological Basis of Health and Disease.
Assessment: 50% continuous assessment; 50% examination.

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

This course will introduce students to the host defence 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.
Prerequisites: Pass in BBMS1001 Introduction to Human Anatomy and Physiology
Assessment: 50% continuous assessment; 50% examination.

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

Cancer has profound health impact on our society as a major killer disease. Rapid research advances have greatly improved our understanding of the disease mechanisms of cancer, which has led to better treatments, detection and prevention strategies. This course will provide a comprehensive overview of the genetic, molecular and cell biological processes involved in the initiation and progression of cancer. The key topics include: hallmarks of cancer, genetic and epigenetic events in cancer cells, concept of cancer stem cells, alterations in signalling pathways and metabolism as well as the emerging importance of tumour microenvironment in cancer cells. The development of novel cancer treatments including targeted therapy and immunotherapy, the challenges due to treatment resistance, tumour recurrence and tumour heterogeneity will also be covered. These current concepts in molecular and cellular biology of cancer will be illustrated in the context of different human tumour types, particular those with local prevalence.
Prerequisite: Pass in any one of the following courses: BBMS2003 Human Genetics, BBMS2007 Essential Molecular Biology, BBMS3002 Molecular Biology of the Cell, BIOL3401 Molecular Biology, BIOL3408 Genetics or equivalent courses.
Assessment: 50% continuous assessment; 50% examination.

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

This course will introduce protein structure and contemporary proteomics relevant to biomedical sciences. Protein structure will include protein structure classification and identification, protein modelling, and structure determination by X-ray crystallography and cryo-EM. Proteomics will include protein mass spectrometry, isotope labelling, and protein-protein interaction techniques.
Prerequisite: Pass in any one of the following courses: BBMS2007 Essential Molecular Biology, BIOC2600 Basic Biochemistry, BIOL2220 Principles of Biochemistry, BIOL3401 Molecular Biology, BMED2301 Life Sciences I (Biochemistry).
Assessment: 50% continuous assessment; 50% examination.

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

This course will present topics applicable to human genetics and genomic biology in the "post-genome" era. Main topics include The Human Genome Project; technologies for genomic analysis such as microarrays and high-throughput sequencing; and bioinformatics for handling, analysing and interpreting genomic data, making use of standard analysis programs and public genomic resources such as the HapMap, 1000 Genome, ENCODE and Epigenetic Roadmap. We also show how the application of genome science to human diseases has led to improved understanding of disease aetiology and mechanisms. Students will gain knowledge and understanding in genomics that will be useful in their future career, be it in science or industry.
Prerequisites: Pass in any one of these courses: BBMS2013 Biomedical Statistics, BIOL2102 Biostatistics or BIOF1001 Introduction to Biomedical Data Science; and any one of these courses:

BBMS2003 Human Genetics, BBMS2007 Essential Molecular Biology, BIOL3401 Molecular Biology, BIOL3408 Genetics, or equivalent courses.
Assessment: 50% assignment; 50% examination.

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

This course will introduce students to the comparative human/animal infections and emerging infectious diseases with emphasis on zoonotic viral infections and resistance to antibiotics. The course analyses the emerging patterns of microbes of recent concern, focusing on the particularly innovative molecular processes these organisms use to ensure their success in adaptation, surviving, multiplying and transmission 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 knowledge of pathogenesis, pandemic potential, prevention, control and eradication of pathogens.
Prerequisite: Pass in BBMS1001 Introduction to Human Anatomy and Physiology or equivalent.
Assessment: 50% continuous assessment; 50% examination.

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

This is an advanced course aiming to provide students with the latest frontier on molecular and cellular mechanisms that underlie the structure and function of the central nervous system. This interdisciplinary course covers fundamental concepts on the molecular basis of brain functions during development and aging, and discusses how dysregulation of these processes might lead to various brain disorders. Topics include axon guidance, synaptic transmission, formation and plasticity of synapses, sensation, learning and memory, and diseases of the nervous systems such as cognitive and emotional disturbance. Latest techniques in neuroscience research, such as the use of viral-mediated expression of transgenes, optogenetics, chemogenetics, and induced pluripotent stem cells, will be introduced. Lectures, tutorials, presentation of research papers, and research-oriented practical training are emphasised so as to expose students to different areas in molecular neuroscience through multiple learning activities.
Prerequisite: Pass in any one of the following courses: BBMS1001 Introduction to Human Anatomy and Physiology, BIOL1110 From Molecules to Cells, BIOC2600 Basic Biochemistry, BIOL2220 Principles of Biochemistry, BMED2302/MEDE2302 Life Sciences II (Cell Biology & Physiology), PSYC2101 Foundations of Neuroscience I, PSYC2110 Developmental Neuroscience.
Assessment: 50% continuous assessment; 50% examination.

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

Stem cell research and biotechnology has great promise for the future of regenerative medicine. The course covers the stem cell biology of various organ systems particularly in the context of human diseases, the state-of-the-art biotechnologies for stem cell research and their applications in disease modelling, treatment and drug development. In addition, non-scientific aspects such as bioethics, political developments, future development and challenges of stem cell research will also be discussed. Hands-on laboratory experience will be provided. Upon completion, students should have solid knowledge of stem cell biology and their implications in tissue homeostasis and diseases, as well as the latest biotechnologies for stem cell research and their applications.
Prerequisite: Pass in any one of the following courses: BIOC2600 Basic Biochemistry, BIOL2220 Fundamentals of Biochemistry, BIOL3401 Molecular Biology, BBMS2007 Essential Molecular Biology, BBMS3002 Molecular Biology of the Cell, BMED2301 Life Sciences I (Biochemistry).
Assessment: 50% continuous assessment; 50% examination.

BBMS3018 Biomechanics and Biomedical Technologies **Year 3/4 (6 credits)**

The Biomechanics and Biomedical Technology course provides fundamental understanding of the human anatomy and physiology with application of the modern biomedical technology and prosthetic devices. In general, the course provides an overview of body anatomy and physiology, the structural function and mechanical properties of biodynamics and biological tissues. Specific course topics will

include structure and function relationships in tissues and organs; application of stress and strain analysis to biological tissues; analysis of forces in human function and movement; energy and power in human activity; and introduction to modelling viscoelasticity of tissues. In addition, students will be provided with unique learning approach in theoretical background and cutting-edge laboratory hands-on biomedical technology experience.
Prerequisite: Pass in any one of the following courses: BBMS2004 Human Anatomy, BBMS2006 Physiological Basis of Health and Disease, BIOL3205 Human Physiology, BMED2302/MEDE2302 Life Sciences II (Cell Biology & Physiology), BMED3301/MEDE3301 Life Sciences III (Physiology).
Assessment: 60% continuous assessment; 40% examination.

BBMS3019 Topographic Anatomy and Anatomy Education Year 3/4 (6 credits)

The course provides a comprehensive understanding of the structures, relationships and functions in human body, with the focus on topographic anatomy. The course covers the topographic anatomy of the thorax, abdomen, pelvis, perineum, back, limbs, head and neck, and neuroanatomy. The course also introduces essential concepts in anatomy education and offer hands-on peer-teaching experience to students.
Prerequisite: Pass in BBMS2004 Human Anatomy.
Assessment: 100% continuous assessment.

BBMS4003 Developmental Genetics Year 3/4 (6 credits)

This course covers the genetic bases as well as cellular and molecular processes of embryo development. Topics include: genetic control of body plans and pattern formation, morphogenesis, cell fate determination, formation of organ systems such as lung, kidney, vascular, skeletal and nervous systems, germ cells and sex determination, stem cells, regeneration, common congenital malformations, and key signalling molecules involved. Methods and technologies for studying developmental genetics, studies of model organisms, and examples relevant to human diseases and modern medicine are discussed.
Prerequisite: Pass in any one of these courses: BBMS2003 Human Genetics, BBMS2007 Essential Molecular Biology, BIOL3401 Molecular Biology, BIOL3408 Genetics, BBMS3002 Molecular Biology of the Cell or equivalent courses.
Assessment: 50% continuous assessment; 50% examination.

BBMS4005 Biopharmaceutical Research and Development Year 3/4 (6 credits)

This course focuses on the research and development of innovative medicines, including drugs and biologicals. Principles and methodologies for identification of receptors, enzymes, lipids and nucleic acids as drug targets will be discussed. The mechanism-based discovery of life-saving and life-enhancing new medicines during the past 10 years will be emphasised, especially for certain complex diseases and conditions such as ageing, diabetes type 2 and obesity. In addition, the new approaches for AI-based handling on information of biopharmaceutics will be introduced.
Prerequisite: Pass in any of the following courses: BBMS2005 Biomedical Pharmacology, BBMS2008 Contemporary Topics in Biomedical Technology, BIOC2600 Basic Biochemistry, BBMS3012 Stem Cell Biotechnologies in Regenerative Medicine, BMED2302/MEDE2302 Life Sciences II (Cell Biology & Physiology).
Assessment: 70% continuous assessment; 30% examination.
Remark: Not for students who have passed BPHM4142 Molecular Pharmacology, or have already enrolled in this course.

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, analyse, and compare protein and DNA sequences using bioinformatics tools

available on the internet. A basic introduction to the principles and tools for the analysis of next generation sequencing data will also be presented.
Prerequisite: Pass in one of the following courses: BIOC2600 Basic Biochemistry, BIOL2220 Principles of Biochemistry, BBMS2003 Human Genetics, BBMS2007 Essential Molecular Biology, BMED2301/MEDE2301 Life Sciences I (Biochemistry).
Assessment: 50% coursework; 50% examination.

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

To provide an up-to-date knowledge of molecular biology, especially with respect to the regulation of eukaryotic gene expression.
Prerequisite: Pass in any one of the following courses: BIOC3601 Basic Metabolism, BIOL3401 Molecular Biology, BIOL3402 Cell Biology and Cell Technology, BIOL3404 Protein Structure and Function, BBMS2007 Essential Molecular Biology.
Assessment: 50% assignment; 50% examination.

EXSC3014 Rehabilitation Science Year 1/2/3/4 (6 credits)

This course will present both theoretical perspectives and applied aspects of rehabilitation science. Students will study human functional capacity as it relates to deficits of neuromuscular, cardiovascular and respiratory mechanisms that underlie functional disability. Emphasis is placed on the application of fundamental theoretical principles to enhance human performance and quality of life of persons with movement difficulties in dynamic environments.
Assessment: 100% continuous assessment.

EXSC3018 Biological Basis of Exercise and Health Year 1/2/3/4 (6 credits)

This course will address the question "why exercise can result in improvement of human health?" by providing an in-depth discussion on the latest discovered biological mechanisms that are responsible for the widespread beneficial effects of exercise on health, including the anti-inflammatory effect, antioxidant effect, myokines, cardioprotective effect, fat-beiging effect, glucose-lowering effect, anti-cancer effect, and brain health effect of exercise. This course will also explore the fundamental cellular and molecular mechanisms that underpin the physiological adaptations from exercise leading to the enhancement of human health. Students will participate in practical sessions held in the laboratory to assess their own body fat.
Assessment: 100% coursework.

EXSC3019 Exercise and Chronic Diseases Year 1/2/3/4 (6 credits)

Exercise and chronic diseases course will introduce you to the prevention, rehabilitation and management of the chronic conditions in which exercise can play a vital role. You will learn effective ways to change the behaviour of an individual regarding exercise and how to design safe and effective exercise programmes for individuals with chronic diseases. You will be exposed to clinical case scenarios with the primary objective to develop the skills in evidence-based practice.
Assessment: 100% coursework.

Courses for Minor in Biotechnology & Clinical Research

BBMS1001 Introduction to Human Anatomy and Physiology Year 1 (6 credits)

This course examines the concepts related to the structure and function of the human body, including the organisation of the body from single cell to the coordinated whole. Throughout the course, focus will be placed on the inter-relationship between structure and function in cells, tissues and body systems (cardiovascular, respiratory, digestive, renal, musculoskeletal, neural, 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: 50% continuous assessment; 50% examination.

BBMS2005 Biomedical Pharmacology Year 2 (6 credits)

This course provides basic information on the general principles in pharmacology, pharmacokinetics, pharmacodynamics and pharmacogenomics. The interaction of drugs with different body systems will also be covered. In addition, commonly used anti-microbial, anti-inflammatory and anti-cancer drugs will be introduced. This knowledge is highly relevant and applicable to clinical trial and biotechnology-related drug research.
Prerequisite: Pass in CHEM1042 General Chemistry I or CHEM1041 Foundations of Chemistry.
Assessment: 50% continuous assessment; 50% examination.

BBMS2009 Introduction to Clinical Research Year 2 (6 credits)

The purpose of clinical research is to determine the safety and efficacy of treatments intended for human use. It helps researchers to learn how to prevent, diagnose and treat human illness. Clinical Trial is a key type of clinical research. The aim of this course is to equip students with necessary knowledge and skills for planning, designing and conducting clinical trials. The overall course learning outcome is to build a strong understanding of the scientific, practical, and ethical aspects of clinical trials.
Prerequisite: Pass in any one of the following courses: BIOF1001 Introduction to Biomedical Data Science, BBMS2013 Biomedical Statistics, BIOL2102 Biostatistics, MATH1013 University Mathematics II, MATH1853 Linear Algebra, Probability and Statistics, STAT1601 Elementary Statistical Methods, STAT1603 Introductory Statistics or concurrently enrolled in BBMS2013 Biomedical Statistics.
Assessment: 100% continuous assessment.

BBMS2008 Contemporary Topics in Biomedical Technology Year 2/3 (6 credits)

Biomedical technology brings together the latest innovations from science, medicine and engineering, applying them in biomedical research and healthcare. We are in the midst of a revolution in biomedical technology, with an industry undergoing exponential growth and offering exceptional opportunity for coming decades. This course reflects on major breakthroughs past and present, on frontier technologies in biomedical technology, and on how the intersection between biomedical science and business is set to transform healthcare.
Prerequisite: Pass in any one of the following courses: BBMS1001 Introduction to Human Anatomy and Physiology, BBMS1003/BIOC1600 Perspectives in Biochemistry, BIOL1110 From Molecules to Cells, ENGG1207 Foundations of Biochemistry for Medical Engineering, BMED1207 Fundamentals of Chemistry and Biology for Biomedical Engineering, BIOC2600 Basic Biochemistry, BMED2301/MEDE2301 Life Sciences I (Biochemistry).
Assessment: 100% continuous assessment.

BBMS2010 Fundamentals of Clinical Trial Management Year 2/3 (6 credits)

Clinical trial management, an essential aspect of clinical trials, is critical to the reliability and acceptability of drug, technology, or clinical intervention trials. Good clinical practice (GCP) refers to a set of international quality standards that defines the processes and regulations under which clinical trials on human subject's function. This course is designed to explain GCP and prepare students with skills in the conduct and management of clinical trials based on GCP and other regulatory requirements. The course is also integral to preparing students for a career in clinical trial research and management.
Assessment: 100% continuous assessment.

BBMS3012 Stem Cell Biotechnologies in Regenerative Medicine Year 3/4 (6 credits)

Stem cell research and biotechnology has great promise for the future of regenerative medicine. The course covers the stem cell biology of various organ systems particularly in the context of human diseases, the state-of-the-art biotechnologies for stem cell research and their applications in disease modelling, treatment and drug development. In addition, non-scientific aspects such as bioethics, political developments, future development and challenges of stem cell research will also be discussed. Hands-on laboratory experience will be provided. Upon completion, students should have solid knowledge of stem cell biology and their implications in tissue homeostasis and diseases, as well as the latest biotechnologies for stem cell research and their applications.
Prerequisite: Pass in any one of the following courses: BIOC2600 Basic Biochemistry, BIOL2220 Fundamentals of Biochemistry, BIOL3401 Molecular Biology, BBMS2007 Essential Molecular Biology, BBMS3002 Molecular Biology of the Cell, BMED2301 Life Sciences I (Biochemistry).
Assessment: 50% continuous assessment; 50% examination.

BBMS3018 Biomechanics and Biomedical Technologies Year 3/4 (6 credits)

The Biomechanics and Biomedical Technology course provides fundamental understanding of the human anatomy and physiology with application of the modern biomedical technology and prosthetic devices. In general, the course provides an overview of body anatomy and physiology, the structural function and mechanical properties of biodynamics and biological tissues. Specific course topics will include structure and function relationships in tissues and organs; application of stress and strain analysis to biological tissues; analysis of forces in human function and movement; energy and power in human activity; and introduction to modelling viscoelasticity of tissues. In addition, students will be provided with unique learning approach in theoretical background and cutting-edge laboratory hands-on biomedical technology experience.
Prerequisite: Pass in any one of the following courses: BBMS2004 Human Anatomy, BBMS2006 Physiological Basis of Health and Disease, BIOL3205 Human Physiology, BMED2302/MEDE2302 Life Sciences II (Cell Biology & Physiology), BMED3301/MEDE3301 Life Sciences III (Physiology).
Assessment: 60% continuous assessment; 40% examination.

BIOL2409 Biotechnology Industry and Entrepreneurship Year 2/3/4 (6 credits)

The course will give an overview of the innovative developments in biotech industry and provide the students with useful tools in learning how an exciting research idea can be turned into a viable business.
Prerequisite: Pass in BIOL1110 From Molecules to Cells.
Assessment: 20% test, 50% assignments and 30% presentation.
Remark: Not for Year 1 students. Priority will be given to students majoring in MBB / MBB intensive major.

BBMS4005 Biopharmaceutical Research and Development Year 3/4 (6 credits)

This course focuses on the research and development of innovative medicines, including drugs and biologicals. Principles and methodologies for identification of receptors, enzymes, lipids and nucleic acids as drug targets will be discussed. The mechanism-based discovery of life-saving and life-enhancing new medicines during the past 10 years will be emphasised, especially for certain complex diseases and conditions such as ageing, diabetes type 2 and obesity. In addition, the new approaches for AI-based handling on information of biopharmaceutics will be introduced.
Prerequisite: Pass in any of the following courses: BBMS2005 Biomedical Pharmacology, BBMS2008 Contemporary Topics in Biomedical Technology, BIOC2600 Basic Biochemistry, BBMS3012 Stem Cell Biotechnologies in Regenerative Medicine, BMED2302/MEDE2302 Life Sciences II (Cell Biology & Physiology).
Assessment: 70% continuous assessment; 30% examination.

Remark: Not for students who have passed BPHM4142 Molecular Pharmacology, or have already enrolled in this course.

BMED4604 Cell and Tissue Engineering **Year 3/4 (6 credits)**

This course firstly introduces the nature on cell and tissue organization, tissue dynamic processes including development, homeostatis and wound healing. Second, it reviews in detail the basic components of engineered tissues including cells, scaffolds and signals. For cells, important cellular-fate processes such as attachment, migration, proliferation, differentiation and apoptosis, and the cell culture technology will be reviewed before focusing on stem cells and their relevance in tissue engineering. For scaffolds, the analogous role of scaffolds and extracellular matrix of native tissues will be compared and the technological advancement in scaffold design and fabrication will be highlighted. On signals, different types of cell-regulating signals including soluble biofactors, insoluble matrix factors and cell-cell interactions and biophysical signals such as topological and mechanical signals will be introduced before an integrative summary on the application of these signals in designing stem cell niche can be made. Apart from employing these signals extrinsically, direct genetic manipulation of cells can also achieve the purpose of modifying cellular functions. The basic understanding and technological achievement of gene transfer and delivery and its applications in tissue engineering will be covered.
Prerequisites: BMED1207 Fundamentals of Chemistry and Biology for Biomedical Engineering, BMED2206 Engineering in Biology and Medicine, BMED2301 Life Sciences I (Biochemistry), BMED2302 Life Sciences II (Cell Biology & Physiology) and BMED3301 Life Sciences III (Physiology).
Assessment: 20% practical work, 20% continuous assessment; 60% examination.
Remark: BMED4604 for candidates admitted under the 4-year BBiomedSc curriculum in the academic year 2018-19 and thereafter.

Courses for Minor in Genetics & Genomics

BBMS1003 Perspectives in Biochemistry **Year 1 (6 credits)**

This course aims to:
- Teach students a biochemical perspective on each of the Basic Sciences focusing on concepts fundamental to the learning of Biochemistry.
- Promote deep learning of course material through an integrated programme of practical and collaborative tasks.
- Inspire students with a view of the great discoveries and future challenges for Biochemistry.
- Help students make the transition from school to university by developing their teamwork, independent study skills and confidence to communicate within a Biochemistry learning environment.

Prerequisite: Level 3 or above in HKDSE Biology, Chemistry, or Combined Science with Biology or Chemistry component, or equivalent.
Assessment: 50% continuous assessment; 50% examination.
Remark: Not for students who have passed or are enrolled in BIOL1110 From Molecules to Cells or BIOC1600 Perspectives in Biochemistry.

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

This course aims to:
- Teach students a biochemical perspective on each of the Basic Sciences focusing on concepts fundamental to the learning of Biochemistry.
- Promote deep learning of course material through an integrated programme of practical and collaborative tasks.
- Inspire students with a view of the great discoveries and future challenges for Biochemistry.

- Help students make the transition from school to university by developing their teamwork, independent study skills and confidence to communicate within a Biochemistry learning environment.

Prerequisite: Level 3 or above in HKDSE Biology, Chemistry, or Combined Science with Biology or Chemistry component, or equivalent
Assessment: 50% continuous assessment; 50% examination.
Remarks: Not for students who have passed or are enrolled in BIOL1110 From Molecules to Cells or BBMS1003 Perspectives in Biochemistry.

BBMS2007 Essential Molecular Biology Year 2 (6 credits)

This course aims to enable the students to understand the basics in molecular biology including the process and machineries involving in the storage, utilisation and maintenance of the genetic information and the corresponding genomes.
Prerequisite: Pass in BBMS1003/BIOC1600 Perspectives in Biochemistry, BMED1207 Fundamentals of Chemistry and Biology for Biomedical Engineering or BIOL1110 From Molecules to Cells.
Assessment: 60% continuous assessment; 40% examination.
Remark: Not for students who have passed BIOL3401 Molecular Biology, or have already enrolled in this course.

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 covered include Mendel's laws of genetics, basic patterns of Mendelian inheritance in humans, the construction and analysis of pedigrees, 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 Introduction to Human Anatomy and Physiology; BBMS1003/BIOC1600 Perspectives in Biochemistry or BIOL1110 From Molecules to Cells.
Assessment: 50% continuous assessment; 50% examination.

BBMS3007 Cancer Biology Year 3/4 (6 credits)

Cancer has profound health impact on our society as a major killer disease. Rapid research advances have greatly improved our understanding of the disease mechanisms of cancer, which has led to better treatments, detection and prevention strategies. This course will provide a comprehensive overview of the genetic, molecular and cell biological processes involved in the initiation and progression of cancer. The key topics include: hallmarks of cancer, genetic and epigenetic events in cancer cells, concept of cancer stem cells, alterations in signalling pathways and metabolism as well as the emerging importance of tumour microenvironment in cancer cells. The development of novel cancer treatments including targeted therapy and immunotherapy, the challenges due to treatment resistance, tumour recurrence and tumour heterogeneity will also be covered. These current concepts in molecular and cellular biology of cancer will be illustrated in the context of different human tumour types, particular those with local prevalence.
Prerequisite: Pass in any one of the following courses: BBMS2003 Human Genetics, BBMS2007 Essential Molecular Biology, BBMS3002 Molecular Biology of the Cell, BIOL3401 Molecular Biology, BIOL3408 Genetics or equivalent courses.
Assessment: 50% continuous assessment; 50% examination.

BBMS3008 Essential Proteomics Year 3/4 (6 credits)

This course will introduce protein structure and contemporary proteomics relevant to biomedical sciences. Protein structure will include protein structure classification and identification, protein

modelling, and structure determination by X-ray crystallography and cryo-EM. Proteomics will include protein mass spectrometry, isotope labelling, and protein-protein interaction techniques.
Prerequisite: Pass in any one of the following courses: BBMS2007 Essential Molecular Biology, BIOC2600 Basic Biochemistry, BIOL2220 Principles of Biochemistry, BIOL3401 Molecular Biology, BMED2301 Life Sciences I (Biochemistry).
Assessment: 50% continuous assessment; 50% examination.

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

This course will present topics applicable to human genetics and genomic biology in the "post-genome" era. Main topics include The Human Genome Project; technologies for genomic analysis such as microarrays and high-throughput sequencing; and bioinformatics for handling, analysing and interpreting genomic data, making use of standard analysis programs and public genomic resources such as the HapMap, 1000 Genome, ENCODE and Epigenetic Roadmap. We also show how the application of genome science to human diseases has led to improved understanding of disease aetiology and mechanisms. Students will gain knowledge and understanding in genomics that will be useful in their future career, be it in science or industry.
Prerequisites: Pass in any one of these courses: BBMS2013 Biomedical Statistics, BIOL2102 Biostatistics or BIOF1001 Introduction to Biomedical Data Science; and any one of these courses: BBMS2003 Human Genetics, BBMS2007 Essential Molecular Biology, BIOL3401 Molecular Biology, BIOL3408 Genetics, or equivalent courses.
Assessment: 50% assignment; 50% examination.

BBMS4003 Developmental Genetics **Year 3/4 (6 credits)**

This course covers the genetic bases as well as cellular and molecular processes of embryo development. Topics include: genetic control of body plans and pattern formation, morphogenesis, cell fate determination, formation of organ systems such as lung, kidney, vascular, skeletal and nervous systems, germ cells and sex determination, stem cells, regeneration, common congenital malformations, and key signalling molecules involved. Methods and technologies for studying developmental genetics, studies of model organisms, and examples relevant to human diseases and modern medicine are discussed.
Prerequisite: Pass in any one of these courses: BBMS2003 Human Genetics, BBMS2007 Essential Molecular Biology, BIOL3401 Molecular Biology, BIOL3408 Genetics, BBMS3002 Molecular Biology of the Cell or equivalent courses.
Assessment: 50% continuous assessment; 50% 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, analyse, and compare protein and DNA sequences using bioinformatics tools available on the internet. A basic introduction to the principles and tools for the analysis of next generation sequencing data will also be presented.
Prerequisite: Pass in one of the following courses: BIOC2600 Basic Biochemistry, BIOL2220 Principles of Biochemistry, BBMS2003 Human Genetics, BBMS2007 Essential Molecular Biology, BMED2301/MEDE2301 Life Sciences I (Biochemistry).
Assessment: 50% coursework; 50% examination.

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

To provide an up-to-date knowledge of molecular biology, especially with respect to the regulation of eukaryotic gene expression.
Prerequisite: Pass in any one of the following courses: BIOC3601 Basic Metabolism, BIOL3401 Molecular Biology, BIOL3402 Cell Biology and Cell Technology, BIOL3404 Protein Structure and Function, BBMS2007 Essential Molecular Biology.

Assessment: 50% assignment; 50% examination.

BBMS4004 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 main features of public health genetics research will be highlighted including how genetic and environmental factors play a role in disease susceptibility; emergence of biobanks; cancer genomics; precision medicine; and Mendelian randomisation. This course will also 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 policy questions raised when applying genomics to health care.
Prerequisites: Pass in either BBMS2013 Biomedical Statistics or BIOL2102 Biostatistics; and BBMS2003 Human Genetics.
Assessment: 100% continuous assessment.

BIOF3002 Genome Sequencing and Analysis **Year 3/4 (6 credits)**

This comprehensive course is designed to provide biomedical scientists with an end-to-end understanding of high-throughput genome sequencing, encompassing all aspects from sample preparation and sequencing to data analysis using portable DNA sequencing technology. Participants will acquire hands-on expertise in the operation of portable DNA sequencers and their capacity to generate genomics data. Leveraging the acquired datasets and additional publicly available genome resources, students will employ advanced bioinformatics methodologies to address targeted biological inquiries. Additionally, participants will cultivate skills in managing genome sequencing data and effectively presenting genomic findings to a professional scientific audience. This course will supplement theoretical knowledge gained in BBMS3009 (Genome Sciences) and help equip students with the necessary proficiency for academic research or to work in industries that use genomic technologies.
Prerequisite: Eligible for students who have successfully completed BIOF1001 Introduction to Biomedical Data Science plus completed or are enrolled in BBMS3009 Genome Science.
Assessment: 100% continuous assessment including project reports and presentation.

Courses for Minor in Kinesiology

BBMS1001 Introduction to Human Anatomy and Physiology **Year 1 (6 credits)**

This course examines the concepts related to the structure and function of the human body, including the organisation of the body from single cell to the coordinated whole. Throughout the course, focus will be placed on the inter-relationship between structure and function in cells, tissues and body systems (cardiovascular, respiratory, digestive, renal, musculoskeletal, neural, 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: 50% continuous assessment; 50% examination.

EXSC2003 Exercise Physiology **Year 1/2/3/4 (6 credits)**

This course will introduce the key physiological and metabolic responses to acute and chronic exercise. Students will examine and evaluate physiological changes that occur to respiratory, cardiovascular and musculoskeletal systems during an acute bout of exercise and following a period of exercise training. The physiological basis of anaerobic and aerobic training and muscle training will be discussed. The environmental factors such as temperature and altitude that affect the responses to exercise will also be discussed. Students will participate in practical sessions held in the exercise physiology laboratory to assess their own anaerobic power and aerobic capacity.
Assessment: 100% coursework.

EXSC2007 Exercise Prescription and Training Year 2 (6 credits)

This course will introduce the theoretical constructs underpinning exercise prescription and training and equip students with fundamental knowledge, critical thinking and skills to assess components of physical fitness and design exercise programs on the basis of available scientific evidence. This course will also contribute to prepare students for exercise professional accreditation.
Assessment: 100% coursework.

EXSC2008 Physical and Health Benefits of Exercise Year 2/3 (6 credits)

This course will investigate the role of exercise, physical activity (PA), inactivity and sedentary behaviour in health and wellness, with particular emphasis on the role of exercise and physical activity in the prevention and treatment of major non-communicable diseases (NCDs). Key terms relating to PA will be defined. Various PA measurement methods and their use in PA epidemiology and public health research will be discussed. Students will learn about fundamental study designs and methodologies used in evaluating the impacts of PA on health. Students will obtain skills and knowledge necessary to critically evaluate evidence on health benefits of PA. Students will learn whether the beneficial impacts of PA on health outcomes are independent of, or modified by other health risk factors, such as obesity, sedentary behaviour and genetic risk.
Assessment: 100% coursework.

EXSC2009 Exercise Biomechanics Year 1/2/3/4 (6 credits)

This course will introduce you to the basic concepts of mechanics on the structure and function of the human movement. You will develop an understanding of the mechanical principles and rules that are governing motion. Examples and case studies from real life will be used to enhance your understanding of how the laws of mechanics can be applied so as to contribute to maintaining the health or even the performance of the individual/athlete.
Assessment: 100% coursework.

EXSC2010 Measurement and Evaluation of Physical Activity Year 1/2/3/4 (6 credits)

This course will introduce students to the basic concepts, principles and applications of physical activity measurement and evaluation. Students will be able to describe advantages and disadvantages of various physical activity assessment tools. Moreover, students will learn about historical and new techniques needed to measure and evaluate physical activity. In addition, students will learn how emerging wearable technologies can be utilized under various applications to increase physical activity and decrease sedentary time. Students will also be able to apply various measurement techniques to evaluate the accuracy of physical activity assessment tools.
Assessment: 100% continuous assessment.
Remark: This course is equivalent to EXSC2006 Measurement of Physical Activity.

BBMS3018 Biomechanics and Biomedical Technologies Year 3/4 (6 credits)

The Biomechanics and Biomedical Technology course provides fundamental understanding of the human anatomy and physiology with application of the modern biomedical technology and prosthetic devices. In general, the course provides an overview of body anatomy and physiology, the structural function and mechanical properties of biodynamics and biological tissues. Specific course topics will include structure and function relationships in tissues and organs; application of stress and strain analysis to biological tissues; analysis of forces in human function and movement; energy and power in human activity; and introduction to modelling viscoelasticity of tissues. In addition, students will be provided with unique learning approach in theoretical background and cutting-edge laboratory hands-on biomedical technology experience.
Prerequisite: Pass in any one of the following courses: BBMS2004 Human Anatomy, BBMS2006 Physiological Basis of Health and Disease, BIOL3205 Human Physiology, BMED2302/MEDE2302

Life Sciences II (Cell Biology & Physiology), BMED3301/MEDE3301 Life Sciences III (Physiology).
Assessment: 60% continuous assessment; 40% examination.

EXSC3017 Nutrition for Exercise and Health **Year 3/4 (6 credits)**

This course will introduce the basic principles of human nutrition and the functional role of nutritional components such as water/fluid, vitamins, minerals, carbohydrate, fat, and protein for health and exercise performance. Students will be exposed to effective nutritional practices that positively influence exercise performance according to available scientific evidence.
Assessment: 100% coursework.
Remark: This course is equivalent to EXSC3013 Sport and Exercise Nutrition.

EXSC3018 Biological Basis of Exercise and Health **Year 1/2/3/4 (6 credits)**

This course will address the question "why exercise can result in improvement of human health?" by providing an in-depth discussion on the latest discovered biological mechanisms that are responsible for the widespread beneficial effects of exercise on health, including the anti-inflammatory effect, antioxidant effect, myokines, cardioprotective effect, fat-beiging effect, glucose-lowering effect, anti-cancer effect, and brain health effect of exercise. This course will also explore the fundamental cellular and molecular mechanisms that underpin the physiological adaptations from exercise leading to the enhancement of human health. Students will participate in practical sessions held in the laboratory to assess their own body fat.
Assessment: 100% coursework.

EXSC3019 Exercise and Chronic Diseases **Year 1/2/3/4 (6 credits)**

Exercise and chronic diseases course will introduce you to the prevention, rehabilitation and management of the chronic conditions in which exercise can play a vital role. You will learn effective ways to change the behaviour of an individual regarding exercise and how to design safe and effective exercise programmes for individuals with chronic diseases. You will be exposed to clinical case scenarios with the primary objective to develop the skills in evidence-based practice.
Assessment: 100% coursework.

Non-credit bearing course

UG5E1001 Introduction to the Constitution, the Basic Law and the National Security Law **Year 1/2/3/4**

This online course is based on pre-recorded lectures (PRLs) and study materials which are prepared by the Faculty of Law. Students will adopt a self-directed learning approach.
This course aims to provide a basic introduction of the Constitution, the Basic Law and the National Security Law. The supplementary materials provide students with an opportunity to examine the international perspective on the topics under study.