SYLLABUSES FOR THE DEGREE OF BACHELOR OF ENGINEERING (BENG)

General Engineering courses (applicable to candidates admitted to the four-year curriculum in the academic year 2012-13 and thereafter)

General Engineering courses include:

Computer Programming Courses

ENGG1111 Computer programming and applications (6 credits)
ENGG1112 Computer programming and applications I (6 credits)

Mathematics and Physics Courses

MATH1851 Calculus and ordinary differential equations (6 credits)
MATH1853 Linear algebra, probability and statistics (6 credits)
PHYS1050 Physics for Engineering Students (6 credits)

Disciplinary Specific Courses

ENGG1201 Engineering for sustainable development (6 credits)
ENGG1202 Introduction to computer science (6 credits)
ENGG1203 Introduction to electrical and electronic engineering (6 credits)
ENGG1204 Industrial management and logistics (6 credits)
ENGG1205 Introduction to mechanical engineering (6 credits)
ENGG1206 Introduction to biomedical engineering (6 credits)
ENGG1207 Foundations of biochemistry for medical engineering (6 credits)

Candidates are required to satisfactorily complete General Engineering courses as specified in the syllabus of the programme concerned.

The course descriptions of the General Engineering courses are as follows:

ENGG1111. Computer programming and applications (6 credits)

This course covers both the basic and advanced features of the C/C++ programming languages, including syntax, identifiers, data types, control statements, functions, arrays, file access, objects and classes, class string, structures and pointers. It introduces programming techniques such as recursion, linked lists and dynamic data structures. The concept and skills of program design, implementation and debugging, with emphasis on problem-solving, will also be covered.

Target students are those who wish to complete the programming course in a more intensive mode in 1 semester. Students with some programming knowledge are encouraged to take this course.

Assessment: 50% continuous assessment, 50% examination

ENGG1112. Computer programming and applications I (6 credits)

This course covers both the basic and advanced features of the C/C++ programming languages, including syntax, identifiers, data types, control statements, functions, arrays, file access, objects and classes, class string, structures and pointers. It introduces programming techniques such as recursion, linked lists and
dynamic data structures. The concept and skills of program design, implementation and debugging, with emphasis on problem-solving, will also be covered.

Target students are those who wish to complete the programming course in a slower pace covering 2 semesters.

Assessment: 50% continuous assessment, 50% examination

MATH1851. Calculus and ordinary differential equations (6 credits)

In this course, students will be introduced to some important topics of mathematics commonly used in many engineering fields. A concrete foundation of engineering mathematics that underpins the various engineering subjects will be built. Mathematical concepts and principles, as well as some typical engineering applications, would be emphasized so that students could enhance their mathematical skills in solving engineering problems, and be well prepared in learning a higher level of applied mathematics required in different engineering disciplines.

Assessment: 20% continuous assessment, 80% examination

MATH1853. Linear algebra, probability and statistics (6 credits)

As the consecutive course of MATH1851, students will be introduced to more topics of mathematics commonly applied in engineering so that students could be further enhanced with a concrete skill in mathematics underpinned for different engineering subjects. The course emphasizes mathematical concepts, principles, analysis, and their relationship to the modelling of engineering systems. Students could be furnished with the essential mathematical skill to analytically tackle some typical engineering problems to prepare for all the engineering subjects.

Assessment: 20% continuous assessment, 80% examination

PHYS1050. Physics for Engineering Students (6 credits)

Units and Dimensional Analysis, Motion of a Particle in One and Two Dimensions, Newton’s Laws of Motion, Friction, Curvilinear and Circular Motion on a Plane, Force, Impulse and Momentum, Force Polygon and Static Equilibrium, Work and Energy, System of Particles, Moment of Inertia and Rotation of a Rigid Body, Simple Harmonic Motion and Pendulum;


Assessment: 50% continuous assessment, 50% examination
ENGG1201. Engineering for sustainable development (6 credits)

Natural and human-made environment; urban resource consumption and environmental pollution; past and present civil engineering wonders; modern engineering systems; role of civil engineers in a changing world; sustainable cities and the future.

Assessment: 50% continuous assessment, 50% examination

ENGG1202. Introduction to computer science (6 credits)

This course introduces a number of real-world computational problems taken from different areas of computer science (e.g. security and cryptography, artificial intelligence, database, web and networking). Through these problems and some hands-on exercises, students are exposed to the mathematics, data structures and algorithms that form the foundations of computer science and see how these elements integrated together to solve those problems.

Assessment: 100% continuous assessment

ENGG1203. Introduction to electrical and electronic engineering (6 credits)

This course provides an overview of the general field of electrical and electronic engineering and its role in the modern world. The function of different electronic engineering disciplines in modern electronic system designs will be introduced, including signal processing, system-level design, digital logic design, circuits design, as well as electronic devices design. The role of electrical systems and their impact on the environment will also be discussed. Finally, the socio-economical impact of electrical and electronic technologies will be introduced.

Assessment: 40% practical work, 20% continuous assessment, 40% examination

ENGG1204. Industrial management and logistics (6 credits)

The fundamental role of logistics and supply chain management in the economy and organisation; contribution of logistics and supply chain management to value creation; introduction to logistics industry in Hong Kong; contemporary topics in logistics and supply chain management.

Essential management and business skills for engineers; introduction to project management; global manufacturing; applications of industrial engineering principles in different sectors and industries; quality functions; performance improvement; basics of problem solving and decision making.

Assessment: 100% continuous assessment

ENGG1205. Introduction to Mechanical Engineering (6 credits)

Modeling of mechanical systems; working principles of robots; mechanics and propulsion of aircrafts; strong materials; hands-on projects.

Assessment: 30% continuous assessment, 70% examination
ENGG1206. Introduction to biomedical engineering (6 credits)

This course is an overview of the essential areas in biomedical engineering including technologies and application in life sciences and medicine. The course is broadly divided into 4 areas: biomechanics and biomaterial; cell and tissue engineering; biomedical instrumentations and sensors; and medical imaging. The global development and other issues such as safety, ethics and industry will also be addressed. The course has a laboratory component to provide the students with some hands-on experience in the subject.

Assessment: 20% practical work, 40% continuous assessment, 40% examination

ENGG1207. Foundations of biochemistry for medical engineering (6 credits)

The course is comprised of four areas of fundamentals, namely:

A. Chemistry for Biochemistry

Revisiting the elements and bonding (from carbon to Coenzyme A); Resonance and orbital theory (a focus on the electron); Structure and conformation (thinking in 3 dimensions); Isomerism (from mirrors to thalidomide); Water (the universal biochemical solvent); Quantitation in chemistry (who was Avogadro anyway?)

B. Biology for Biochemistry

The basic building blocks of life (proteins, DNA, lipids, carbohydrate); The Central Dogma of Molecular Biology; Evolution (considering molecular evolution); Origins of life (the chicken-egg paradox of proteins and DNA)

C. Physics and Mathematics for Biochemistry

Thermodynamics from a Biological Perspective; Introduction to molecular recognition and binding (DNA melting); Statistics for biochemistry (applied statistics for what you really need to know); Thinking numbers (exponentials, logs and the limits of life).

D. Inspiring Biochemistry

The protein (from Perutz to the frontier of proteomics); The gene (from the double helix to the human genome project and how it failed to live up to its expectations); Vitamins and disease (stories of scientific discovery motivated by human suffering); Synthetic biology (a cure to the world's energy problems or misplaced trust in dangerous technology); The challenges of modern-day genetics (will we ever really understand individuality; Drugs-successes, failures, and perhaps the most challenging business on earth.

Assessment: 70% continuous assessment, 30% examination
University Language Enhancement Courses

All the students admitted to the Bachelor of Engineering curriculum under common code admission are required to take two English language enhancement courses and one Chinese language enhancement course in the study year as specified in the syllabuses of respective BEng curriculum:

CAES1000 Core University English
CAES95## English in the Discipline course for respective BEng curriculum
CENG9001 Practical Chinese for engineering students

COURSE DESCRIPTIONS

CAES1000. Core University English (6 credits)

The Core University English (CUE) 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 ofur 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% continuous assessment, 40% examination.

CENG9001. Practical Chinese for engineering students (6 credits)
(to be taken at the first semester of third year of study)

The course is designed to enable students to gain a mastery of the varieties of the Chinese language as used in the field of Engineering. It introduces students to various techniques for the effective use of practical Chinese. The course will familiarize students with traditional Chinese characters, simplified Chinese characters, modern Chinese grammar and rhetoric through outcomes-based assignments. Special training that is intended to sharpen students’ presentation skills in Cantonese and Putonghua will also be provided.

Assessment: 50% continuous assessment, 50% examination.

1 Putonghua-speaking students should take CUND9002 or CUND9003. Students who have not studied Chinese language during their secondary education / who have not attained the requisite level of competence in the Chinese language to take CENG9001 can apply (i) to take credit-bearing Cantonese or Putonghua language courses offered by the School of Chinese especially for international and exchange students; OR (ii) to be exempted from the Chinese language requirement and take an elective course in lieu.
CAES95## English in the Discipline course for respective BEng curriculum (6 credits) [to be taken in the study year as specified in the syllabuses of respective BEng curriculum]

Apart from “CAES1000 Core University English”, BEng students must complete a 6-credit English in the Discipline (ED) course as specified in the syllabuses of respective BEng curriculum, with the summary of the list of ED courses as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>BEng Curriculum</th>
<th>Year/Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAES9520</td>
<td>Technical English for Industrial and Manufacturing Systems Engineering</td>
<td>BEng(IETM) BEng(LESCM)</td>
<td>Semester 2, Year 2</td>
</tr>
<tr>
<td>CAES9530</td>
<td>Technical English for Mechanical and Building Services Engineering</td>
<td>BEng(ME) BEng(ME-BSE)</td>
<td>Semester 2, Year 3</td>
</tr>
<tr>
<td>CAES9531</td>
<td>Technical English for Medical Engineering</td>
<td>BEng(MedE)</td>
<td>Semester 1, Year 3</td>
</tr>
<tr>
<td>CAES9540</td>
<td>Technical English for Civil Engineering</td>
<td>BEng(CivE) BEng(Civ-EnvE)</td>
<td>Semester 1, Year 4</td>
</tr>
<tr>
<td>CAES9541</td>
<td>Technical English for Electrical and Electronic Engineering</td>
<td>BEng(CE) BEng(ElecE) BEng(EE)</td>
<td>Semester 2, Year 4</td>
</tr>
<tr>
<td>CAES9542</td>
<td>Technical English for Computer Science</td>
<td>BEng(CompSc)</td>
<td>Semester 1, Year 4</td>
</tr>
</tbody>
</table>

Minor Option

Candidates are given an option to pursue a minor in a discipline outside their own degree curriculum. Candidates who wish to have their minor recorded on the transcript must take and pass all the required courses in the selected minor as specified by the offering Department/Faculty in addition to the graduation requirements of their own degree curriculum. For the descriptions of the course under minor options, candidates should refer to the syllabuses of the relevant degree.

Courses taken to fulfil the Minor Option requirements may also be considered as equivalent courses that satisfy the elective requirements of the BEng curriculum, subject to the approval of the Board of the Faculty of Engineering.

Double-Degrees in BEng/BBA Option

Candidates are given an option to pursue the double-degrees in BEng/BBA, subject to the approval of the Boards of the Faculty of Engineering and Faculty of Business and Economics upon their meeting the prescribed admission requirements as laid down by both the Faculty of Engineering and the Faculty of Business and Economics.
Courses taken to fulfil the double-degrees curriculum requirements may also be considered as equivalent courses that satisfy the elective requirements of the BEng curriculum, subject to the approval of the Board of the Faculty of Engineering.

Candidates who have satisfied all the requirements of the BEng curriculum will be awarded the degree of Bachelor of Engineering. To be eligible for proceeding to the BBA programme in the 5th year, candidates must:

1. fulfil the requirements of the BEng curriculum;
2. hold a degree of BEng with Second Class Honours from The University of Hong Kong; and
3. pass the 54 credits of courses, as listed below, as required by the Faculty of Business and Economics during their study for BEng:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT1101</td>
<td>Introduction to financial accounting</td>
<td>6</td>
</tr>
<tr>
<td>IIMT2601</td>
<td>Management information systems</td>
<td>6</td>
</tr>
<tr>
<td>MKGT2501</td>
<td>Introduction to marketing</td>
<td>6</td>
</tr>
<tr>
<td>MGMT2401</td>
<td>Principles of management</td>
<td>6</td>
</tr>
<tr>
<td>ECON1210</td>
<td>Introduction to economics I</td>
<td>6</td>
</tr>
<tr>
<td>FINA1310</td>
<td>Corporate finance</td>
<td>6</td>
</tr>
<tr>
<td>ACCT2105</td>
<td>Introduction to management accounting</td>
<td>6</td>
</tr>
<tr>
<td>Electives</td>
<td>(Any 2 courses in HRM, Marketing or Wealth Management major as specified below)</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>54</td>
</tr>
</tbody>
</table>

Elective courses for BEng/BBA (Human Resource Management, HRM)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT3403</td>
<td>Leadership</td>
<td>6</td>
</tr>
<tr>
<td>MGMT3405</td>
<td>Organizational behaviour</td>
<td>6</td>
</tr>
<tr>
<td>MGMT3415</td>
<td>Principles of entrepreneurship</td>
<td>6</td>
</tr>
<tr>
<td>MGMT3429</td>
<td>Human resource management and business strategy</td>
<td>6</td>
</tr>
<tr>
<td>MGMT3434</td>
<td>Human resource: theory and practice</td>
<td>6</td>
</tr>
<tr>
<td>MGMT3475</td>
<td>Current topics in human resource management</td>
<td>6</td>
</tr>
</tbody>
</table>

Elective courses for BEng/BBA (Marketing)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKTG3501</td>
<td>Consumer behaviour</td>
<td>6</td>
</tr>
<tr>
<td>MKTG3502</td>
<td>Marketing research</td>
<td>6</td>
</tr>
<tr>
<td>MKTG3525</td>
<td>Services marketing</td>
<td>6</td>
</tr>
<tr>
<td>MKTG3531</td>
<td>Strategic marketing management</td>
<td>6</td>
</tr>
</tbody>
</table>
Elective courses for BEng/BBA (Wealth Management)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT3107</td>
<td>Hong Kong taxation</td>
<td>6</td>
</tr>
<tr>
<td>FINA2320</td>
<td>Investment and portfolio analysis</td>
<td>6</td>
</tr>
<tr>
<td>FINA2322</td>
<td>Derivatives</td>
<td>6</td>
</tr>
<tr>
<td>FINA2325</td>
<td>Alternative investments</td>
<td>6</td>
</tr>
<tr>
<td>FINA2342</td>
<td>Insurance: theory and practice</td>
<td>6</td>
</tr>
</tbody>
</table>

Subject to approval of the Board of the Faculty of Engineering, candidates who have completed the requirements of BEng and decide not to proceed to the study for BBA may be awarded with a minor as specified by the Faculty of Business and Economics, if they have completed not less than 36 to 48 credits of courses in compliance with the syllabuses for the minor programme.

To obtain the degree of BBA, candidates must satisfactorily complete 114 credits of courses, 54 of which shall be completed during the study for BEng and 60 of which shall be completed during the 5th year in accordance with the Regulations and Syllabuses for the Degree of BBA in Conjunction with the Degree of BEng.

Note: Candidates may refer to the "Regulations for the Degree of Bachelor of Business Administration (BBA) in conjunction with the Degree of Bachelor of Engineering (BEng)" and "Syllabuses for the Degree of Bachelor of Business Administration (BBA) in conjunction with the Degree of Bachelor of Engineering (BEng)" for the regulations, length and contents of courses for the double-degrees in BEng/BBA option.