SYLLABUS FOR THE DEGREE OF
BACHELOR OF ENGINEERING IN ENGINEERING SCIENCE [BEng(EngSc)]

The syllabus applies to students admitted in the academic year 2022-23 and thereafter under the four-year curriculum.

Curriculum Structure

Candidates are required to complete not fewer than 240 credits in accordance with the regulations and syllabuses for the Bachelor of Engineering degree in Engineering Science. The curriculum structure of the Bachelor of Engineering degree in Engineering Science is as follows:

Course Categories	No. of credits
UG5 Requirements	
• English language enhancement courses	12
• Chinese language enhancement courses	6
• Common Core Curriculum Courses	36
• Non-credit bearing courses as required by the University	0
Sub-total	***54***
Major option in Engineering Science	
• Engineering Core Courses	30 to 36
• BEng (EngSc) Programme Common Core Courses	18[#]
• Discipline Introductory Courses	12 to 18
• Discipline Advanced Courses	12 to 18
• Capstone Experience	6 to 12 (+6[#])
• Discipline Elective Courses	0 to 18
Sub-total	***96***
Elective Courses (including Discipline Elective Courses, Second Major/Minor option; Free Electives)	*90*
Total	**240**

[#] The Programme Common Core Course "Engineering research and innovation" also falls into the category of capstone experience. The 6 credits of this course are already counted under the category of Programme Common Core Course.

Major Options

- Systems Analytics
- Environmental Engineering
- Energy Engineering
- Materials Engineering
- Healthcare Engineering

Curriculum

The Curriculum comprises 240 credits of courses as follows:

Engineering Core Courses
Students are required to complete 30 to 36 credits of Engineering Core Courses.

BEng (EngSc) Programme Common Core Courses
Students are required to complete ALL three programme common core courses (18 credits). Double-counting is NOT allowed. Where a course applies to more than a major or minor programme, a disciplinary elective must be taken in lieu of the overlapped courses.

Discipline Core Courses
Students are required to complete ALL discipline core courses in accordance with the syllabuses of major option concerned (24 to 30 credits), comprising introductory core courses and advanced core courses.

Discipline Elective Courses
Students are required to complete 0 to 18 credits of discipline elective courses in accordance with the syllabuses of major option concerned.

Elective Courses
Students are required to complete at least 90 credits of elective course(s) offered by departments within or outside of the Faculty of Engineering.

University Requirements
Students are required to complete:

a) 12 credits in English language enhancement, including 6 credits in "CAES1000 Core University English" and 6 credits in English-in-the-Discipline course of respective major option;
b) 6 credits in Chinese language enhancement course "CENG9001 Practical Chinese for engineering students";
c) 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
d) non-credit bearing courses as required by the University.

Capstone Experience
Students are required to complete 6-credit or 12-credit capstone experience course of respective major option to fulfill the capstone experience requirement for the degree of BEng in Engineering Science. The Programme Common Core Course "Engineering research and innovation" also falls into the category of capstone experience. The 6 credits of this course are already counted under the above-mentioned category of Programme Common Core Course.

In addition to the above requirements:
Students who take Energy Engineering, Environmental Engineering, Healthcare Engineering or Materials Engineering major but have not reached HKDSE Physics Level 3 or above, or equivalent, have to take the course "PHYS1240 Physics by Inquiry", in their first year.

Degree Classification

The degree of Bachelor of Engineering shall be awarded in five divisions in accordance with ES 15 of the Regulations for the Degree of Bachelor of Engineering in Engineering Science and UG 9 of the Regulations for First Degree Curricula.

The details of the distribution of the above course categories are as follows:

The curriculum of BEng in Engineering Science degree comprises 240 credits of courses with the following structure:

A. Common Requirements for all major options in BEng in Engineering Science

UG 5 Requirements (54 credits)

Course Code	Course	No. of credits
CAES1000	Core University English	6
CAES95##	English in the Discipline course*	6
CENG9001	Practical Chinese for engineering students	6
CC##XXXX	University Common Core Course (6 courses) **	36
XXXXxxxx	Non-credit bearing courses as required by the University	0
Total for UG5 Requirements		54

*English in the Discipline course of respective major options of BEng in Engineering Science curriculum is as follows:

Course Code	Course Title	Major option of BEng(EngSc)	Year/ Semester
CAES9544	Technical English for Mechanical Engineering	Materials Engineering	Semester 2, Year 3/Year 4
CAES9531	Technical English for Biomedical Engineering	Healthcare Engineering	Semester 1, Year 3
CAES9540	Technical English for Civil Engineering	Environmental Engineering	Semester 1, Year 3/Year 4
CAES9541	Technical English for Electrical and Electronic Engineering	Energy Engineering	Semester 2, Year 3/Year 4
CAES9532	Technical English for Industrial and Manufacturing Systems Engineering	Systems Analytics	Semester 1, Year 4

** Students have to complete 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.

B. Specific Requirements for Individual Major Option of BEng in Engineering Science degree

1. Systems Analytics

Engineering Core Courses (30 credits)

Course Code	Course Title	No. of credits
MATH1851	Calculus and ordinary differential equations	6
MATH1853	Linear algebra, probability & statistics	6
ENGG1320	Engineers in the modern world	6
ENGG1330	Computer programming I	6
ENGG1340	Computer programming II	6
Total for Engineering Core Courses		30

BEng (EngSc) Programme Common Core Courses (18 credits)

Course Code	Course Title	No. of credits
IMSE3115	Engineering economics and finance	6
IMSE2051	Engineering statistics and analytics	6
IMSE4051	Engineering research and innovation[#]	6
Total for BEng (EngSc) Programme Common Core Courses		18

Discipline Core Courses (30 credits)

Introductory Courses (12 credits)

Course Code	Course Title	No. of credits
COMP2119	Introduction to data structures and algorithms	6
IMSE2134	Operational research	6
Total for Introductory Discipline Core Courses		12

Advanced Courses (18 credits)

Course Code	Course Title	No. of credits
IMSE3107	Systems modelling and simulation	6
IMSE3136	Operational planning and control	6
Choose one of the following *		
COMP3314	Machine learning	6
IMSE3111	Intelligent optimisation	6
Total for Advanced Discipline Core Courses		18

* Students cannot take both COMP3314 and IMSE3111

Capstone Experience (12 credits (+ 6 credits[#]))

Course Code	Course Title	No. of credits
IMSE4175	Project	12
Total for Capstone Experience		12 (+6[#])

[#] The Programme Common Core Course "Engineering research and innovation" also falls into the category of capstone experience. The 6 credits of this course are already counted under the category of Programme Common Core Course.

Discipline Elective Courses (6 credits)

Course Code	Course Title	No. of credits
COMP3278	Introduction to database management systems	6
ELEC3249	Pattern recognition and machine intelligence	6
ELEC4543	Fuzzy systems and neural networks	6
ELEC4544	Artificial intelligence and deep learning	6
ELEC4545	Time series analysis with financial applications	6
ELEC4546	Investment and trading for engineering students	6
IMSE3103	Systems automation	6
IMSE3137	Virtual reality for systems engineering	6
IMSE3139	Cyber-physical systems	6
IMSE4110	Financial engineering	6
IMSE4119	Digital enterprises and e-commerce	6
IMSE4137	Operational risk management	6
LLAW3069	Regulation of financial markets	6
Total for Discipline Elective Courses		6

Elective Courses (90 credits)

At least 90 credits of elective course(s) offered by departments within or outside of the Faculty of Engineering.

Note: Students can take Research Postgraduate courses as discipline elective course subject to the approval of the Programme Director.

Reference Table for BEng in Engineering Science (Systems Analytics)

Year	Language	Common Core	Engineering Core/Programme Common Core	Discipline Core/Capstone Experience	Discipline Electives	Elective Courses	Total
1	12	18	30	0	0	0	60
2	0	12	6	18	0	24	60
3	6	6	6	12	0	30	60
4	0	0	6	12	6	36	60
Total	**18**	**36**	**48**	**42**	**6**	**90**	**240**

2. Environmental Engineering

Engineering Core Courses (30 credits)

Course Code	Course Title	No. of credits
MATH1851	Calculus and ordinary differential equations	6
MATH1853	Linear algebra, probability & statistics	6
ENGG1320	Engineers in the modern world	6
ENGG1330	Computer programming I	6
ENGG1350	Thermofluid mechanics	6
Total for Engineering Core Courses		30

BEng (EngSc) Programme Common Core Courses (18 credits)

Course Code	Course Title	No. of credits
IMSE3115	Engineering economics and finance	6
IMSE2051	Engineering statistics and analytics	6
IMSE4051	Engineering research and innovation[#]	6
Total for BEng (EngSc) Programme Common Core Courses		18

Discipline Core Courses (24 credits)

Introductory Courses (12 credits)

Course Code	Course Title	No. of credits
CIVL1105	Environmental engineering	6
CIVL2103	Fluid mechanics	6
Total for Introductory Discipline Core Courses		12

Advanced Courses (12 credits)

Course Code	Course Title	No. of credits
CIVL2104	Hydraulics and hydrology	6
MECH2407	Multivariable calculus and partial differential equations	6
Total for Advanced Discipline Core Courses		12

Capstone Experience (6-12 credits (+ 6 credits[#]))

Course Code	Course Title	No. of credits
CIVL 4101	Capstone design project	6
OR		
CIVL4102	Project	12
Total for Capstone Experience		6-12 (+6[#])

[#] The Programme Common Core Course "Engineering research and innovation" also falls into the category of capstone experience. The 6 credits of this course are already counted under the category of Programme Common Core Course.

Discipline Elective Courses (12-18 credits)

Course Code	Course Title	No. of credits
CIME2101	Water & air quality: concepts & measurements	6
CIVL3106	Engineering hydraulics	6
CIVL3107	Environmental impact assessment of civil engineering projects	6
CIVL3111	Wastewater treatment	6
CIVL3115	Solid and hazardous waste management	6
CIVL3121	Water resources engineering	6
CIVL3122	Wind engineering	6
MECH3420	Air pollution control	6
MECH4428	Sound and vibration	6
Total for Discipline Elective Courses		12-18

Elective Courses (90 credits)

At least 90 credits of elective course(s) offered by departments within or outside of the Faculty of Engineering.

Note: Students can take Research Postgraduate courses as discipline elective course subject to the approval of the Programme Director.

Reference Table for BEng in Engineering Science (Environmental Engineering)

Year	Language	Common Core	Engineering Core/Programme Common Core	Discipline Core/Capstone Experience	Discipline Electives	Elective Courses	Total
1	12	18	30	0	0	0	60
2	0	18	6	24	0	12	60
3	6	0	6	6-12	12-18	24	60
4	0	0	6	0	0	54	60
Total	**18**	**36**	**48**	**30-36**	**12-18**	**90**	**240**

3. Energy Engineering

Engineering Core Courses (36 credits)

Course Code	Course Title	No. of credits
MATH1851	Calculus and ordinary differential equations	6
MATH1853	Linear algebra, probability & statistics	6
ENGG1300	Fundamental mechanics	6
ENGG1310	Electricity and electronics	6
ENGG1320	Engineers in the modern world	6
ENGG1330	Computer programming I	6
Total for Engineering Core Courses		36

BEng (EngSc) Programme Common Core Courses (18 credits)

Course Code	Course Title	No. of credits
IMSE3115	Engineering economics and finance	6
IMSE2051	Engineering statistics and analytics	6
IMSE4051	Engineering research and innovation[#]	6
Total for BEng (EngSc) Programme Common Core Courses		18

Discipline Core Courses (30 credits)

Introductory Courses (12 credits)

Course Code	Course Title	No. of credits
ELEC2147	Electrical energy technology	6
ELEC2346	Electric circuit theory	6
Total for Introductory Discipline Core Courses		12

Advanced Courses (18 credits)

Course Code	Course Title	No. of credits
ELEC3141	Power transmission and distribution	6
ELEC3142	Electrical energy conversion	6
ELEC3143	Power electronics	6
Total for Advanced Discipline Core Courses		18

Capstone Experience (6-12 credits (+ 6 credits[#]))

Course Code	Course Title	No. of credits
ELEC3848	Integrated design project	6
OR		
ELEC4848	Senior design project	12
Total for Capstone Experience		6 – 12 (+6[#])

[#] The Programme Common Core Course "Engineering research and innovation" also falls into the category of capstone experience. The 6 credits of this course are already counted under the category of Programme Common Core Course.

Discipline Elective Courses (0-6 credits)

Course Code	Course Title	No. of credits
ELEC2243	Introduction to electricity and magnetism	6
MECH2407	Multivariable calculus and partial differential equations	6
ELEC3241	Signal and linear systems	6
ELEC3844	Engineering management and society	6
ELEC4141	Electric railway systems	6
ELEC4142	Power system protection and switchgear	6
ELEC4144	Electric vehicle technology	6
ELEC4145	Building services – electrical services	6
ELEC4146	Building services – electrical installations	6
ELEC4147	Power system analysis and control	6
MECH3418	Dynamics and control	6
MECH4409	Energy conversion systems	6
MECH4411	Heat transfer	6
Total for Discipline Elective Courses		0-6

Elective Courses (90 credits)

At least 90 credits of elective course(s) offered by departments within or outside of the Faculty of Engineering.

Note: Students can take Research Postgraduate courses as discipline elective course subject to the approval of the Programme Director.

Reference Table for BEng in Engineering Science (Energy Engineering)

Year	Language	Common Core	Engineering Core/Programme Common Core	Discipline Core/Capstone Experience	Discipline Electives	Elective Courses	Total
1	6	12	36	6	0	0	60
2	0	24	6	18	0	12	60
3	12	0	6	12 - 18	0-6	24	60
4	0	0	6	0	0	54	60
Total	**18**	**36**	**54**	**36-42**	**0-6**	**90**	**240**

4. Materials Engineering

Engineering Core Courses (36 credits)

Course Code	Course Title	No. of credits
MATH1851	Calculus and ordinary differential equations	6
MATH1853	Linear algebra, probability & statistics	6
ENGG1300	Fundamental mechanics	6
ENGG1310	Electricity and electronics	6
ENGG1330	Computer programming I	6
ENGG1350	Thermofluid mechanics	6
Total for Engineering Core Courses		36

BEng (EngSc) Programme Common Core Courses (18 credits)

Course Code	Course Title	No. of credits
IMSE3115	Engineering economics and finance	6
IMSE2051	Engineering statistics and analytics	6
IMSE4051	Engineering research and innovation[#]	6
Total for BEng (EngSc) Programme Common Core Courses		18

Discipline Core Courses (30 credits)

Introductory Courses (18 credits)

Course Code	Course Title	No. of credits
MECH2413	Engineering mechanics	6
MECH2419	Properties of materials	6
ELEC2243	Introduction to electricity and magnetism	6
Total for Introductory Discipline Core Courses		18

Advanced Courses (12 credits)

Course Code	Course Title	No. of credits
ELEC3347	Electronic materials and quantum physics	6
BMED3600	Biomaterials science and engineering	6
Total for Advanced Discipline Core Courses		12

Capstone Experience (6-12 credits (+ 6 credits[#]))

Course Code	Course Title	No. of credits
MECH3427	Design and manufacture	6
OR		
MECH4429	Integrated capstone experience	12
Total for Capstone Experience Courses		6 – 12 (+6[#])

[#] The Programme Common Core Course "Engineering research and innovation" also falls into the category of capstone experience. The 6 credits of this course are already counted under the category of Programme Common Core Course.

Discipline Elective Courses (0-6 credits)

Course Code	Course Title	No. of credits
MECH2404	Drawing and elements of design and manufacture	6
IMSE3106	Manufacturing technology	6
ELEC4248	Photonic systems technologies	6
MECH3409	Mechanics of solids	6
MECH3416	Fundamentals of aeronautical engineering	6
MECH4412	Product design and development	6
MECH4414	Materials for engineering applications	6
MECH4415	Applied stress and strength analysis	6
BMED4500	Biomedical instrumentation and systems	6
Total for Discipline Elective Courses		0-6

Elective Courses (90 credits)

At least 90 credits of elective course(s) offered by departments within or outside of the Faculty of Engineering.

Note: Students can take Research Postgraduate courses as discipline elective course subject to the approval of the Programme Director.

Reference Table for BEng in Engineering Science (Materials Engineering)

Year	Language	Common Core	Engineering Core/ Programme Common Core	Discipline Core/Capstone Experience	Discipline Electives	Elective Courses	Total
1	6	12	36	6	0	0	60
2	0	24	6	24	0	6	60
3	12	0	6	6-12	0-6	30	60
4	0	0	6	0	0	54	60
Total	**18**	**36**	**54**	**36-42**	**0-6**	**90**	**240**

5. Healthcare Engineering

Engineering Core Courses (36 credits)

Course Code	Course Title	No. of credits
MATH1851	Calculus and ordinary differential equations	6
MATH1853	Linear algebra, probability & statistics	6
ENGG1300	Fundamental mechanics	6
ENGG1310	Electricity and electronics	6
ENGG1330	Computer programming I	6
ENGG1350	Thermofluid mechanics	6
Total for Engineering Core Courses		36

BEng (EngSc) Programme Common Core Courses (18 credits)

Course Code	Course Title	No. of credits
IMSE3115	Engineering economics and finance	6
IMSE2051	Engineering statistics and analytics	6
IMSE4051	Engineering research and innovation[#]	6
Total for BEng (EngSc) Programme Common Core Courses		18

Discipline Core Courses (24 credits)

Introductory Courses (12 credits)

Course Code	Course Title	No. of credits
BMED2206	Engineering in biology and medicine	6
BMED2301	Life sciences I (Biochemistry)	6
Total for Introductory Discipline Core Courses		12

Advanced Courses (12 credits)

Course Code	Course Title	No. of credits
BMED2302	Life sciences II (Cell Biology & Physiology)	6
IMSE4538	Healthcare systems engineering	6
Total for Advanced Discipline Core Courses		12

Capstone Experience (6-12 credits (+ 6 credits[#]))

Course Code	Course Title	No. of credits
BMED3010	Integrated project	6
OR		
BMED4010	Final year project	12
Total for Capstone Experience		6 – 12 (+6[#])

[#] The Programme Common Core Course "Engineering research and innovation" also falls into the category of capstone experience. The 6 credits of this course are already counted under the category of Programme Common Core Course.

Discipline Elective Courses (6-12 credits)

Course Code	Course Title	No. of credits
BMED2810	Engineering management and society	6
BMED3301	Life sciences III (Physiology)	6
BMED3500	Electromagnetics in biomedicine	6
BMED3501	Medical imaging	6
BMED3600	Biomaterials science and engineering	6
BMED4500	Biomedical instrumentation and systems	6
BMED4501	Biophotonics	6
BMED4602	Molecular and cellular biomechanics	6
BMED4603	Transport phenomena in biological systems	6
BMED4604	Cell and tissue engineering	6
ELEC4252	Robotic control and vision	6
IMSE3136	Operations planning and control	6
GHAD3002	Health systems and financing	6
GHAD4002	The role and impact of the private sector in health and development	6
Total for Discipline Elective Courses		6-12

Elective Courses (90 credits)

At least 90 credits of elective course(s) offered by departments within or outside of the Faculty of Engineering.

Note: Students can take Research Postgraduate courses as discipline elective course subject to the approval of the Programme Director.

Reference Table for BEng in Engineering Science Healthcare Engineering

Year	Language	Common Core	Engineering Core/ Programme Common Core	Discipline Core/Capstone Experience	Discipline Electives	Elective Courses	Total
1	6	12	36	6	0	0	60
2	0	24	6	12	0	18	60
3	12	0	6	12-18	6-12	18	60
4	0	0	6	0	0	54	60
Total	**18**	**36**	**54**	**30-36**	**6-12**	**90**	**240**

Programme Structure of BEng in Engineering Science - Reference

Major Option/ Course Type	Engineering Core	Programme Common Core[#]	Introductory Course	Advanced Course	Capstone Experience	Discipline Electives	Total
Systems Analytics	30	18	12	18	12 (+ 6[#])	6	96

Environmental Engineering	30	18	12	12	6-12 (+ 6[#])	12-18	96
Energy Engineering	36	18	12	18	6–12 (+ 6[#])	0-6	96
Materials Engineering	36	18	18	12	6–12 (+ 6[#])	0-6	96
Healthcare Engineering	36	18	12	12	6–12 (+ 6[#])	6-12	96

[#] The Programme Common Core Course "Engineering research and innovation" also falls into the category of capstone experience. The 6 credits of this course are already counted under the category of Programme Common Core Course.

Non-credit bearing courses as required by the University
Students will have the flexibility to take the courses in any semester throughout the period of studies.

COURSE DESCRIPTIONS

Candidates will be required to do the coursework in the respective courses selected. Not all courses are offered every semester.

Engineering Core Courses

MATH1851 Calculus and ordinary differential equations (6 credits)
MATH1853 Linear algebra, probability & statistics (6 credits)
ENGG1300 Fundamental mechanics (6 credits)
ENGG1310 Electricity and electronics (6 credits)
ENGG1320 Engineers in the modern world (6 credits)
ENGG1330 Computer programming I (6 credits)
ENGG1340 Computer programming II (6 credits)
ENGG1350 Thermofluid mechanics (6 credits)

Please refer to the Engineering Core Courses in the syllabus for the degree of BEng for details.

PHYS1240. Physics by Inquiry (6 credits)

Please refer to the syllabus of the Bachelor of Science (Physics) programme for course description.

University Requirements on Language Enhancement Courses

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

CAES1000. Core University English (6 credits)

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

Please refer to the University Language Enhancement Courses in the syllabus for the degree of BEng for details.

CAES95##. English in the Discipline course for respective BEng curriculum and BEng(EngSc) major option

Please refer to the syllabus of the respective BEng programmes for course description.

University Common Core Curriculum

Successful completion of 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:

- Science, Technology and Big Data
- Arts and Humanities
- Global Issues
- China: Culture, State and Society

Programme Common Core/Discipline Core/Discipline Elective/Capstone Experience Courses

CIME2101. Water and air quality: concepts and measurement (6 credits)
CIVL1105. Environmental engineering (6 credits)
CIVL2103. Fluid mechanics (6 credits)
CIVL2104. Hydraulics and hydrology (6 credits)
CIVL3106. Engineering hydraulics (6 credits)
CIVL3107. Environmental impact assessment of civil engineering projects (6 credits)
CIVL3111. Wastewater treatment (6 credits)
CIVL3115. Solid and hazardous waste management (6 credits)
CIVL3121. Water resources engineering (6 credits)
CIVL3122. Wind engineering (6 credits)
CIVI 4101 Capstone design project (6 credits)
CIVL4102. Project (12 credits)
CAES9540. Technical English for Civil Engineering (6 credits)

Please refer to the syllabus of the Civil Engineering programme for course description.

COMP2119. Introduction to data structures and algorithms (6 credits)
COMP3278. Introduction to database management systems (6 credits)
COMP3314. Machine learning (6 credits)

Please refer to the syllabus of the Computer Science programme for course description.

ELEC2147. Electrical energy technology (6 credits)
ELEC2243. Introduction to electricity and magnetism (6 credits)
ELEC2346. Electric circuit theory (6 credits)
ELEC3141. Power transmission and distribution (6 credits)
ELEC3142. Electric energy conversion (6 credits)
ELEC3143. Power electronics (6 credits)
ELEC3241. Signals and linear systems (6 credits)
ELEC3249. Pattern recognition and machine intelligence (6 credits)
ELEC3347. Electronic materials and quantum physics (6 credits)
ELEC3844. Engineering management and society (6 credits)
ELEC3848. Integrated design project (6 credits)
ELEC4141. Electric railway systems (6 credits)
ELEC4142. Power system protection and switchgear (6 credits)
ELEC4144. Electric vehicle technology (6 credits)
ELEC4145. Building services- electrical services (6 credits)
ELEC4146. Building services- electrical installations (6 credits)
ELEC4147. Power system analysis and control (6 credits)
ELEC4252. Robotic control and vision (6 credits)
ELEC4248. Photonic systems technologies (6 credits)
ELEC4543. Fuzzy systems and neural networks (6 credits)
ELEC4544. Artificial intelligence and deep learning (6 credits)
ELEC4545. Time series analysis with financial applications (6 credits)
ELEC4546. Investment and trading for engineering students (6 credits)
ELEC4848. Senior design project (12 credits)
CAES9541. Technical English for Electrical and Electronic Engineering (6 credits)

Please refer to the syllabus of the Computer Engineering/Electrical Engineering/Electronic Engineering programme for course description.

IMSE2051. Engineering statistics and analytics (6 credits)

Statistics - random sampling and sampling distributions, point estimation of parameters, confidence interval, hypothesis testing, analysis of variance, regression analysis. Analytics - descriptive analytics, data visualization, predictive analytics, time series forecasting, prescriptive analytics, decision-making under uncertainty, data mining, text analytics. Introduction to data analytics software. Application of statistics and analytics on engineering problems.

Prerequisite: MATH1851 Calculus and ordinary differential equations or MATH1853 Linear algebra, probability & statistics
Assessment: 30% continuous assessment, 70% examination

IMSE4051. Engineering research and innovation (6 credits)

This course is mainly based on group projects with significant social impact: industrial case studies supported by collaborated companies under the supervision of industrial practitioners or academic research project under the supervision of academic professors. Students form small groups of around 4-5 members from different majors to take up a project. This course not only serves as a transdisciplinary Capstone course

but also an internship for students to gain industrial and research experience. They will develop not only hard skills but also soft skills needed in the workplace and in leadership positions. Groups are expected to generate project deliverables of a variety of forms including patents, software copyrights, research papers, proof-of-the-concept solutions and products, consultancy reports / whitepapers, etc.

Assessment: 100% continuous assessment

IMSE4538. Healthcare systems engineering (6 credits)

Introduction to healthcare delivery systems; healthcare technology-human integration; human factors in healthcare; crew resource management; quality of care; economic analysis in healthcare; healthcare logistics; healthcare system test and evaluation; analysis and design for patient safety.

Assessment: 40% continuous assessment, 60% examination

IMSE4175. Project (12 credits)

Case-based learning on systems analysis, design and integration. Most students participate in the case studies and projects initiated by the participating companies in the manufacturing, logistics, service and financial sectors. In collaboration with an industry supervisor, other practitioners and an academic supervisor, the students are expected to develop their quantitative skills in data collection, systems modelling, analysis and visualization, and systems integration. The students will accumulate their hands-on experience in applying their knowledge to real-world scenarios and familiarize themselves with real-world decision-making process.

Assessment: 100% continuous assessment
Co-requisite: CAES9532 Technical English for Industrial and Manufacturing Systems Engineering

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IMSE2134. Operational research (6 credits)
IMSE3103. Systems automation (6 credits)
IMSE3106. Manufacturing technology (6 credits)
IMSE3107. Systems modelling and simulation (6 credits)
IMSE3111. Intelligent optimization (6 credits)
IMSE3115. Engineering economics and finance (6 credits)
IMSE3136. Operations planning and control (6 credits)
IMSE3137. Virtual reality for systems engineering (6 credits)
IMSE3139. Cyber-physical systems (6 credits)
IMSE4110. Financial engineering (6 credits)
IMSE4119. Digital enterprises and e-commerce (6 credits)
IMSE4137. Operational risk management (6 credits)
CAES9532 Technical English for Industrial and Manufacturing Systems Engineering (6 credits)

Please refer to the syllabus of the Industrial Engineering and Logistics Management programme for course description.

MECH2404. Drawing and elements of design and manufacture (6 credits)

MECH2407. Multivariable calculus and partial differential equations (6 credits)
MECH2413. Engineering mechanics (6 credits)
MECH2419. Properties of materials (6 credits)
MECH3409. Mechanics of solids (6 credits)
MECH3416. Fundamentals of aeronautical engineering (6 credits)
MECH3418. Dynamics and control (6 credits)
MECH3420. Air pollution control (6 credits)
MECH3427. Design and manufacture (6 credits)
MECH4409. Energy conversion systems (6 credits)
MECH4411. Heat transfer (6 credits)
MECH4412. Product design and development (6 credits)
MECH4414. Materials for engineering applications (6 credits)
MECH4415. Applied stress and strength analysis (6 credits)
MECH4428. Sound and vibration (6 credits)
MECH4429. Integrated capstone experience (12 credits)
CAES9544. Technical English for Mechanical Engineering (6 credits)

Please refer to the syllabus of the Mechanical Engineering programme for course description.

BMED2206. Engineering in medicine and biology (6 credits)
BMED2301. Life sciences I (Biochemistry) (6 credits)
BMED2302. Life sciences II (Cell Biology & Physiology) (6 credits)
BMED2810 Engineering management and society (6 credits)
BMED3010. Integrated project (6 credits)
BMED3301. Life sciences III (Physiology) (6 credits)
BMED3500. Electromagnetics in biomedicine (6 credits)
BMED3501. Medical imaging (6 credits)
BMED3600. Biomaterials science and engineering (6 credits)
BMED4010. Final year project (12 credits)
BMED4500. Biomedical instrumentation and systems (6 credits)
BMED4501. Biophotonics (6 credits)
BMED4602. Molecular and cellular biomechanics (6 credits)
BMED4603. Transport phenomena in biological systems (6 credits)
BMED4604. Cell and tissue engineering (6 credits)
CAES9531. Technical English for Biomedical Engineering (6 credits)

Please refer to the syllabus of the Biomedical Engineering programme for course description.

LLAW3069. Regulation of financial markets (6 credits)

Please refer to the syllabus of the Bachelor of Laws programme for course description.

GHAD3002. Health systems and financing (6 credits)
GHAD4002. The role and impact of the private sector in health and development (6 credits)

Please refer to the syllabus of the Bachelor of Arts and Sciences in Global Health and Development programme for course description.
