

**REGULATIONS FOR THE DEGREES OF
MASTER OF SCIENCE IN ENGINEERING (MSc[Eng])
MASTER OF SCIENCE IN COMPUTER SCIENCE (MSc[CompSc]), AND
MASTER OF SCIENCE IN ELECTRONIC COMMERCE AND INTERNET COMPUTING
(MSc[ECom&IComp])**

(Applicable to students admitted in the academic year 2024-25 and thereafter)

(See also General Regulations and Regulations for Taught Postgraduate Curricula)

The degrees of MSc(Eng), MSc(CompSc) and MSc(ECom&IComp) are each a postgraduate degree awarded for the satisfactory completion of a prescribed curriculum in the Faculty of Engineering.

For the MSc(Eng) degree, the major part of the curriculum must include courses offered in one of the following fields: building services engineering, civil engineering, electrical and electronic engineering, energy engineering, industrial engineering and logistics management, innovative design and technology, mechanical engineering, and microelectronic science and technology.

The MSc(Eng), MSc(CompSc) and MSc(ECom&IComp) curricula are offered in part-time and full-time modes.

MSc 1 Admission requirements

To be eligible for admission to the curriculum leading to the degree of MSc(Eng) / MSc(CompSc) / MSc(ECom&IComp), a candidate shall:

- (a) comply with the General Regulations;
 - (b) comply with the Regulations for Taught Postgraduate Curricula;
 - (c) hold
 - (i) a Bachelor's degree of this University in a relevant field; or
 - (ii) a relevant qualification of equivalent standard from this University or from another university or comparable institution accepted for this purpose; and
 - (iii) in respect of the courses of study leading to the degree of Master of Science in Engineering in the fields of Innovative Design and Technology and Microelectronic Science and Technology, a Bachelor's degree in Engineering or related Science discipline;
 - (iv) in respect of the courses of study leading to the degree of Master of Science in civil engineering, a Bachelor's degree in related disciplines, such as Environmental Engineering, Chemical Engineering, Mechanical Engineering, Environment-related Sciences, Computer Science, Mathematics or Statistics; and
 - (d) satisfy the examiners in a qualifying examination if required.
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MSc 2 Qualifying Examination

- (a) A qualifying examination may be set to test the candidate's academic ability or his/her ability to follow the curriculum prescribed. It shall consist of one or more written papers or their equivalent and may include a dissertation.
 - (b) A candidate who is required to satisfy the examiners in a qualifying examination shall not be permitted to register until he/she has satisfied the examiners in the examination.
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MSc 3 Period of Study

The curriculum of the degree of MSc(Eng) / MSc(CompSc) / MSc(ESCom&IComp) shall normally extend over one academic year of full-time study or two academic years of part-time study. Candidates shall not be permitted to extend their studies beyond the maximum period of registration of two academic years of full-time study or three academic years of part-time study, unless otherwise permitted or required by the Board of Faculty. For both full-time and part-time modes, the period of study shall include any assessment to be held during and/or at the end of each semester.

MSc 4 Curriculum Requirements

To complete the curriculum, a candidate shall, within the prescribed maximum period of registration stipulated in Regulation MSc3 above:

- (a) satisfy the requirements prescribed in TPG6 of the Regulations for Taught Postgraduate Curricula;
 - (b) take not fewer than 72 credits of courses, in the manner specified in these regulations and syllabuses and pass all courses as specified in the syllabuses;
 - (c) follow courses of instruction and complete satisfactorily all prescribed practical / laboratory work; and
 - (d) satisfy the examiners in all forms of assessment as may be required in either
 - (i) 72 credits of courses which must include a dissertation of 24 credits or a project of 12 credits as capstone experience; or
 - (ii) at least 60 credits of courses successfully completed at this University (which must include a dissertation of 24 credits or a project of 12 credits) and not more than 12 credits of courses successfully completed at this or another university before admission to the MSc(Eng) / MSc(CompSc) / MSc(ESCom&IComp) and approved by the Board of the Faculty.
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MSc 5 Dissertation or project report

- (a) A candidate who is permitted to select a dissertation or a project is required to submit the dissertation or the project report by a date specified by the Board of Examiners.
 - (b) All candidates shall submit a statement that the dissertation or the project report represents his/her own work undertaken after the registration as a candidate for the degree.
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MSc 6 Selection of Courses

- (a) A candidate shall select courses according to the guidelines stipulated in the syllabuses for the degree of MSc(Eng) / MSc(CompSc) / MSc(ECom&IComp).
 - (b) Selection of study patterns, as stipulated in the respective syllabus, shall be subject to the approval of the Head of the Department concerned.
 - (c) Candidates shall select their courses in accordance with these regulations and the guidelines specified in the syllabuses before the beginning of each academic year.
 - (d) 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.
 - (e) Subject to the approval of the Committee on Taught Postgraduate Curricula on the recommendation of the Head of the Department concerned, a candidate may in exceptional circumstances be permitted to select additional course(s).
 - (f) Requests for changes after the designated add/drop period of the semester shall be subject to the approval of the Committee on Taught Postgraduate Curricula. Withdrawal from courses beyond the designated add/drop period will be subject to the approval of the Committee on Taught Postgraduate Curricula.
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MSc 7 Assessment

- (a) The written examination for each course shall be held after the completion of the prescribed course of study for that course, and not later than January, May or August immediately following the completion of the course of study for that course unless otherwise specified in the syllabuses.
 - (b) A candidate, who is unable to complete the requirements within the prescribed maximum period of registration specified in Regulation MSc 3 because of illness or circumstances beyond his/her control, may apply for permission to extend his/her period of studies.
 - (c) A candidate who has failed to satisfy the examiners in any course(s) is required to make up for failed course(s) in the following manners:
 - (i) undergoing re-assessment/re-examination in the failed course(s); or
 - (ii) repeating the failed course(s) by undergoing instruction and satisfying the assessments; or
 - (iii) taking another course in lieu and satisfying the assessment requirements.
 - (d) A candidate who has failed to satisfy the examiners in his/her dissertation or project report may be required to submit or resubmit a dissertation or a project report on the same subject within a period specified by the Board of Examiners.
 - (e) In accordance with G9(h) of the General Regulation and TPG8(d) of the Regulations for Taught Postgraduate Curricula, there shall be no appeal against the results of examinations and all other forms of assessment.
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MSc 8 Grading system

Individual courses shall be graded according to the following grading system as determined by the Board of Examiners:

Standard	Grade	Grade Point
Excellent	A+	4.3
	A	4.0
	A-	3.7
Good	B+	3.3
	B	3.0
	B-	2.7
Satisfactory	C+	2.3
	C	2.0
	C-	1.7
Pass	D+	1.3
	D	1.0
Fail	F	0

MSc 9 Discontinuation of Studies

Unless otherwise permitted by the Board of the Faculty, a candidate will be recommended for discontinuation of their studies in accordance with General Regulation G12 if he/she has:

- (a) failed to pass 12 credits in an academic year; or
- (b) failed to satisfy the examiners at a second attempt in his/her dissertation or project report within the specified period; or
- (c) failed to achieve a cumulative grade point average* (CGPA) of 1.0 or higher for two consecutive semesters with course enrolment; or
- (d) exceeded the maximum period of registration specified in Regulation MSc3.

* *At the end of each semester, a cumulative grade point average (CGPA) for all courses, except cross-listed undergraduate courses and outside curriculum requirement optional courses as specified in the syllabuses, taken by a student (including failed courses) at the time of calculation is computed.*

MSc 10 Advanced Standing

Advanced standing may be granted to candidates in recognition of studies completed successfully before admission to the curriculum in accordance with TPG3 of the Regulations for Taught Postgraduate Curricula. Candidates who are awarded Advanced Standing will not be granted any further credit transfer for those studies for which Advanced Standing has been granted. The amount of credits to be granted for Advanced Standing shall be determined by the Board of the Faculty, in accordance with the following principles:

- (a) a candidate may be granted a total of not more than 20% of the total credits normally required under a curriculum for Advanced Standing unless otherwise approved by the Senate; and
 - (b) credits granted for advanced standing shall not be included in the calculation of the GPA but will be recorded on the transcript of the candidate.
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MSc 11 Award of Degree

To be eligible for the award of the degree of MSc(Eng) / MSc(CompSc) / MSc(ECom&IComp), a candidate shall:

- (a) comply with the General Regulations and the Regulations for Taught Postgraduate Curricula;
 - (b) complete the curriculum and satisfy the examiners in accordance with the regulations set out; and
 - (c) achieve a cumulative grade point average (CGPA) of 1.0 or higher.
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MSc 12 Assessment results

On successful completion of the curriculum, candidates who have shown exceptional merit of achieving a cumulative grade point average (CGPA) of 3.6 or higher may be awarded a mark of distinction, and this mark shall be recorded on the candidates' degree diploma.

Subject to the University's approval

MSC(ENG) IN BUILDING SERVICES ENGINEERING

(Applicable to students admitted to the curriculum in the academic year 2017-18 and thereafter)

Definition and Terminology

Discipline course – any course on a list of courses in the discipline of curriculum which a candidate must pass at least a certain number of credits as specified in the Regulations.

Elective course – any course offered by the Departments of the Faculty of Engineering for the fulfilment of the curriculum requirements of the degree of MSc(Eng) in Building Services Engineering that are not classified as discipline courses.

Capstone Experience – a 24-credit dissertation which is a compulsory and integral part of the curriculum.

Curriculum Structure

Candidates are required to complete 72 credits of courses as set out below, normally over one academic year of full-time study or two academic years of part-time study:

Course Category	No. of Credits
Discipline Courses	Not less than 30
Elective Courses	Not more than 18
Capstone Experience	24
Total	72

The curriculum provides advanced postgraduate education in the fields of design, management and operation of modern building services engineering systems to practising engineers or related professionals who wish to acquire new knowledge and keep abreast of technical developments in the building services industry.

Candidates shall select courses in accordance with the regulations of the degree. Candidates must complete i) 8 courses, including at least 3 courses from List A, and ii) a dissertation. They may select no more than 3 courses offered by other taught postgraduate curricula in the Faculty of Engineering as electives. All course selection will be subject to approval by the Course Coordinators.

The following is a list of discipline courses offered by the Department of Mechanical Engineering. The list below is not final and some courses may not be offered every year.

All courses are assessed through examination and / or coursework assessment, the weightings of which are subject to approval by the Board of Examiners.

List-A discipline courses

MEBS6000. Utility services (6 credits)

Cold and hot water supply: water distribution systems, patterns of usage, estimation of requirements, simultaneous demand, storage capacity, pumping arrangements, calorifiers and water heaters; steam systems: low and high pressure systems, boilers and heat exchangers, steam supply piping and condensate return, insulation, steam trapping; drainage systems and sewage disposal: stormwater and sanitary drainage systems, rainfall intensity, simultaneous sanitary discharge, sizing of drains and sewers, methods of sewage disposal, primary and secondary treatments; security system planning and design; security devices.

MEBS6001. Electrical installations (6 credits)

This course covers the following topics: Supply rules, standards and codes of practice; types of electrical systems; distribution in buildings; factory built assemblies; protective devices and safety interlocks; overcurrent and fault protection; installation design principles; protective earthing and equipotential bonding arrangements; standby generators; electrical safety; distribution transformers; switchgear and fuses; motor control gears; selection of electrical equipment and conductors; lightning protection.

MEBS6002. Lighting engineering (6 credits)

Lighting physics; vision and light measurements; human perception; photometry and spectrophotometry; colorimetry; calculations of photometric data; glare control; guidelines for lighting design. Light production; artificial light sources and luminaires; daylighting; daylight factor; split flux formula; optical control; interior lighting; maintained illuminance; uniformity; colour rendering; utilization factors; polar curves; vector/scalar ratio; lighting for safety; lighting for workplaces; floodlighting; illuminance as vector; illuminance in complex situations.

MEBS6003. Project management (6 credits)

Tendering procedure, contract documents and contract strategy, insurance; project planning, scheduling and control. Management and organization theory and practice; human resources development: motivation; leadership, organization structures, quality management; safety management; environmental issues; communication; disputes; delay analysis.

MEBS7012. Air conditioning and refrigeration (6 credits)

Advanced psychrometry, thermal comfort, load estimation and energy calculation, air conditioning cycles, air conditioning systems: all-air systems, air-water systems, all-water systems; refrigeration: vapour compression cycle, absorption cycle, heat pump cycle; heat rejection: air-cooling, evaporative cooling, cooling tower; ventilation: fresh air requirement, air contamination, fume and dust removal.

Students who have taken and passed MEBS6006 will not be allowed to take MEBS7012.

MEBS7013. Fire service installations (6 credits)

Fire detection and alarm systems; water-based fire extinguishing systems: automatic sprinkler systems, fire hydrant and hose reel systems, drencher systems; gas-based fire extinguishing systems: CO₂ and clean agent systems; special fire extinguishing systems; portable fire extinguishers; means of fire escape; fire resisting construction; statutory regulations governing fire services installations: BS Standards, LPC rules, NFPA codes and local codes of practice; installation, acceptance testing and commissioning.

Students who have taken and passed MEBS6009 or MEBS6021 will not be allowed to take MEBS7013.

List-B discipline courses

MEBS6004. Built environment (6 credits)

External environment: human factors, climatology; internal design criteria; thermal environment (heat): insulation for energy conservation, heat transmission, e.g. solar contribution; visual environment (light): eye and vision, light production, levels of illumination; aural environment (sound or noise): noise criteria for buildings, sources of noise and vibration, noise and vibration control; functional requirement of buildings.

MEBS6005. Building automation systems (6 credits)

Principles of building automation systems: objectives and functions; system configurations; central processor and outstations; transducers, sensors and actuators; distributed processing and intelligence; network architecture; hardware and software. Control fundamentals: Laplace and Z transforms, direct digital PID control; control valve performance Microprocessor and electronics fundamentals: architecture of microprocessor systems; digital-to-analog and analog-to-digital conversions; data sampling. Open systems and interoperability: LonWorks; BACnet; IIOT. Implementation and future development: commissioning; maintenance; integration; building emulator; future development trends.

MEBS6010. Indoor air quality (6 credits)

Concept of indoor air quality, health requirements, sick building syndrome, building related illnesses, indoor air quality indicators, types, sources, characterization and health effects of pollutants, concentration, individual and population exposure, dose-response relationships, measurement and monitoring methods, ventilation, filtration, indoor air quality assessment and control, operation and maintenance, legislation and public policy issues, energy and cost implications.

MEBS6011. Maintenance and management of building facilities (6 credits)

Areas of facilities management; security of facilities; strategies and philosophies of maintenance; optimum control and operation; fault detection and analysis; building pathology; energy management; safety and environmental maintenance. Operational techniques in maintenance: decision making techniques; spares inventory control; resource management; computerized maintenance; measures of maintenance effectiveness. Plant availability, maintainability and reliability.

MEBS6013. Testing and commissioning (6 credits)

The commissioning process: design provisions, specification, documentation, planning and management, contractual responsibilities; setting to work; measurement methods: fundamentals, instrumentation, calibration, methodology, sources of error; commissioning tests on electrical and mechanical plants; balancing of fluid networks; performance testing; post construction evaluation.

MEBS6014. Computer modelling and simulation (6 credits)

Mathematical modelling: modelling of systems; subsystems and components, deterministic and stochastic modelling, steady-state and dynamic modelling, model format, accuracy and validation, applications to thermofluid systems for design, performance evaluation and economic analysis.

Computer simulation: computer implementation of simulation models, simulation methods by successive substitution and Newton-Raphson approach for univariate and multivariate problems, steady-state simulations for system analysis at off-design conditions, dynamic simulations for transient analysis, techniques for simulation of large systems and use of modular computer simulation packages.

MEBS6015. Natural and hybrid ventilation of buildings (6 credits)

Concepts of natural ventilation and hybrid ventilation, mixed-mode air conditioning, purposes of natural ventilation, driving forces, natural ventilation strategies for simple and complex buildings, design methods and guidelines, wind tunnel and small-scale testing, design processes and life-cycle analyses.

MEBS6016. Energy performance of buildings (6 credits)

Energy terms and concepts; energy use in buildings; energy efficient building design and operation; energy efficient technologies; building energy standards and codes; building energy analysis techniques; energy auditing of buildings; economic and financial analyses.

MEBS6017. Building intelligence (6 credits)

Fundamental concepts of intelligent building systems; whole building intelligence; evaluation of building intelligence; needs of occupants, cost effectiveness, economic benefits; engineering intelligence into buildings; information technology; building energy management and control systems; intelligent building design; intelligent controls; expert systems, artificial neural networks, genetic algorithms, fuzzy logic; potential and direction of future developments.

MEBS6018. Clean electrical energy and smart-grids for buildings (6 credits)

Smart-grid and micro-grid models for communities; clean energy sources for smart-grids, disturbance, noise and pollution in smart-grids; power quality regeneration: power conditioning and uninterruptible power supply; interconnection of smart-grids; smart meter management; power factor correction and tariff consideration; building energy codes; lightning protection.

Students who have taken and passed ELEC6095 will not be allowed to take MEBS6018.

MEBS6019. Extra-low-voltage electrical systems in buildings (6 credits)

This course focuses on extra-low-voltage electrical systems: roles, transmission medium and network, modeling, fixed and movable systems; types. Applications in building services: electrical safety; public address system, communication, cable and satellite television, conference and interpretive system, audio and visual system; service integration and automation; system monitoring. Applications in property management: fire and life-saving management equipment, electronic patrol, car park management, efficiency management, CCTV, security system, access and security control, electronic receptionist. Disturbance; electromagnetic interference and protective measures.

MEBS6020. Sustainable building design (6 credits)

Sustainable building concepts; energy and environmental design; green building assessment methods; sustainable masterplanning; analysis methods for sustainable building projects; practical examples.

MEBS7010. Vertical transportation and drive (6 credits)

Types of vertical transportation systems: lifts, escalators and passenger conveyors; their construction and features of lifts and lift-wells. Mechanical drives of systems: traction, hydraulic, and single/double-wrap. Electrical drives of systems: alternating current versus direct current. Illumination, power and ventilation

requirement. Potential hazards and safety management. Prevention of overload and overspeed. Special systems: fireman lift, service lift, stairlift, fireman lift, observation lift, inclined lift, multi-deck lift, public-service escalator, parabolic escalator, and gondola. Traffic calculation and simulation model. Remote monitoring and protocols. Control and adaptive algorithm. Layout of multiple-lift and multiple-escalator. Energy management. Examination, certification and notification.

MEBS7011. Communication technology in building services (6 credits)

Analogue and digital signal encoding; signal transmission systems in buildings; baseband vs broadband; topologies, LAN/MAN/WAN; OSI model, TCP/IP model; wireline and wireless networks; PSTN; key lines, PABX, VoIP; ISDN, DSL, cable modems, FTTH; ISP, voice/data/video convergence; structured cabling; coordination with architects and structural engineers.

MEBS7014. Advanced HVAC applications (6 credits)

Fans and pumps: types and characteristics, parallel and series operation, system effects; complex fluid network analysis: graphical and iterative methods of solution, application to air and water systems and analysis of building air infiltration; room air diffusion: design strategies, application of computational fluid dynamics; sea water cooling systems: design and operation, water treatment; thermal storage systems: applications, system design and economic analysis; acoustic treatment and vibration isolation: basic principles, need for control, types and methods of control.

Students who have taken and passed MEBS6008 will not be allowed to take MEBS7014.

MEBS7015. Fire science and smoke control (6 credits)

Characteristics and behavior of fire; compartment fire: heat release rate, pre-flashover, flashover, post-flashover phases; fire hazards of materials and buildings; means of fire escape; smoke control: active and passive smoke extraction, staircase pressurization, smoke venting, atrium smoke control; statutory regulations governing smoke control installations: BS Standards, NFPA codes and local codes of practice; installation, acceptance testing and commissioning.

Students who have taken and passed MEBS6009 or MEBS6022 will not be allowed to take MEBS7015.

MECH7012. Principles of engineering management (6 credits)

The focus of this course is on the basic principles, methods, and functions of engineering management. An overview of systems engineering is provided, with coverage on the design and management of an enterprise as an integrated system. The course objectives are: (1) acquire the essential principles of engineering management and understand how to apply these principles in daily practice in industry; and (2) understand and apply methods for managing the operations of engineering companies in the global business environment.

Topics include: systems engineering; core concepts and tools for the management of operations: operations planning and control functions, ERP systems; contemporary topics and approaches in engineering management: supply chain, green management, ethics, corporate social responsibility and compliance, risk and crisis management.

Capstone experience course

MEBS6023. Dissertation (24 credits)

It involves undertaking a practical design or research project which integrates the students' knowledge acquired during the course of studies in the MSc curriculum. The project is closely industrial related to the

design or analysis of building services systems and it allows students to conduct in-depth review and appreciation of the system performances through technical and economic analysis, analytical investigation, and evaluation for optimal design solutions. The project is group based but with substantial individual student contribution.

The objectives are to: (1) simulate a realistic working environment for students so that they can integrate what they have learnt into a real life work problem; (2) allow students to apply engineering principles, design skills, engineering economics and project management in the delivery of practical and optimized solutions for realistic project works; (3) train students to work in groups while contributing their abilities independently; (4) demonstrate an ability to have in-depth analytical investigation or evaluation for industrial related or research type problems.

Pre-requisite: Students must have taken and passed TWO of following courses before taking this course: MESB6000, MEBS6001, MEBS6002, MEBS6019, MEBS7012, MEBS7013. A co-requisite arrangement may be allowed for full-time students who enroll in this course in their Year 1 of studies.

Course approved for reimbursement from the Continuing Education Fund (CEF) (applicable to Hong Kong residents only)

MECH7012. Principles of engineering management (6 credits)