Why is this Major Needed?
As mechanical engineers are irreplaceably important in our society, Mechanical Engineering represents a fundamental branch of engineering knowledge. To fulfill the rapid demands of expanding markets in the areas of automation engineering, dynamical and control analysis, engineering design, and materials/product testing, our Bachelor of Engineering in Mechanical Engineering programme at City University of Hong Kong has been established in order to offer a comprehensive and dynamic curriculum which prepares students with analytical and quantitative skills to tackle scientific and engineering problems, independent and critical thinking to develop/enhance engineering products, and integrated creativity and expertise to generate novel product designs to support sustainable development of the industries.

- Motivated by the fact that the prospects for the development of the Mechanical Engineering industry are greatly expanding, the future manpower demands in the related Mechanical Engineering fields will be greatly increasing.
- Since the establishment of the Closer Economic Partnership Arrangement (CEPA) policy back in 2006, original design manufacturing (ODM) of all the “made-in-HK” consumer products, which involves conceptual engineering design and product research and development, has become the key role of Hong Kong companies.
- In the coming years, it is expected that Hong Kong will have stronger needs in the Mechanical Engineering applications such as intelligent consumer products, improved product design and manufacturing, robotics and industrial automation, synthesis and testing of new materials, micro-devices and instrumentation for medical/healthcare purposes.

Objectives of the Major
The aim of the major of Mechanical Engineering is to prepare students with solid background of the required fundamental knowledge in view of the great need in the industries. Our graduates are expected to serve and contribute to a broad range of mechanical engineering industries in their future careers, including chartered engineers, chief administrators/managers of technical teams, and technology consultants. Some of them can even choose to be entrepreneurs for their own start-up companies.

The objectives of the major are:
- To provide a systematic curriculum by combining education, research and development of innovative technology and enable students to tackle engineering problems in mechanical related areas efficiently and independently.
- To equip students with critical thinking, independent research, qualitative and quantitative analysis capacities. Students can perform high-impact and leading edge research and development for the continuous advancements of both industrial and academic expertise.
- To prepare students for professional employment in areas such as engineering design of materials, dynamical and control analysis, automation engineering, and micro and nano technologies.
- To nurture students to contribute to the community and professional groups with both academic achievements and knowledge transferable products.
**Career Prospects**

Our Bachelor degree programme in Mechanical Engineering was launched in view of the great need in the industries. Long-term careers of our graduates in the industries include qualified mechanical engineers, consumer product designers, automotive system designers, “heating, ventilation, and air conditioning (HVAC)” engineers, system automation engineers, chief administrators/managers of technical teams, and technology consultants. Graduates can also choose to further study in graduate schools for inventing state-of-the-art technologies. Some of them can even choose to be entrepreneurs for their own start-up companies.

**Entrance Requirements and Admission Arrangements**

To be eligible for admission, you must satisfy the University’s General Entrance Requirements, with at least one elective subject in Physics, Chemistry, Biology or Combined Science for HKDSE students.

JUPAS HKDSE students will apply for admission to the Department of Mechanical Engineering (JS1207). They will enter a major after the first year of study. During their first year, students will study a broad range of Gateway Education (GE) and College core courses. The top 40% of students [based on (i) cumulative grade point average (CGPA) at the end of Semester B; (ii) no failed grades in any courses in Semesters A and B; and (iii) completion of at least 30 credit units in Semesters A and B, including the number of credit units specified by the College / respective Home Academic Unit for its required courses] will have free choice of the majors offered by the Department. The other 60% of students will be allocated a major of their choice, subject to the availability of places and the selection criteria set by the Department of Mechanical Engineering.

Direct/non-JUPAS applicants are expected to have, or to be close to having, Associate Degrees or Higher Diplomas with high grades or credit awards in Engineering-related disciplines.

**Curriculum**

While maintaining the major aspects of mechanical engineering knowledge (e.g. engineering mechanics, materials engineering, mechanical product design, mechatronics, dynamics and controls, and thermal fluids), this programme would focus on the following areas for the future needs of the society:

- Product design with comprehensive considerations in high levels of functionality (e.g. smart home and appliances) and the environment-friendly product design and manufacturing.
- Automation (with control algorithms, sensors and actuators) and system integration of machines ranging from consumer products, building facilities to transportation vehicles.
- Solid background on both conventional and emerging mechanical engineering techniques, as integrated knowledge, such that graduates can generate new products, and at the same time can serve as the next generation to handle and inherit obligations of the existing occupations.

The choice of electives will provide students the opportunities to enhance their interests in applying what they have learnt. Appropriate quality assurance processes and guidelines will be adopted to ensure that the new programme will be managed and delivered as all other well-recognized international undergraduate programmes.

The major requires a total of 120 credit units. Applicants with Associate Degree, Higher Diploma or equivalent qualifications may be admitted with Advanced Standing I or II.

**Professional Recognition**

This major has been granted provisional accreditation by the Hong Kong Institution of Engineers (HKIE), a signatory member of the Washington Accord, under which all members agree to recognize each other’s accredited engineering degree programmes.
Why is this Major Needed?

This major is a unique undergraduate programme in Hong Kong, aiming at meeting the current manpower requirements and also future economic challenges of Hong Kong. Students of this major will be trained in multi-disciplinary topics related to nuclear engineering and risk engineering. The major will concentrate on five related focus areas which are nuclear engineering, nuclear medicine and medical radiation, materials engineering, risk engineering, and crisis management. These five focus areas are in general aligned with three of the six industries of Hong Kong, namely testing and certification services, medical services, and environmental industries, which have been identified by the Hong Kong SAR Government as having clear advantages for further development. The following are some of the reasons why this major is needed:

• Rapid development in nuclear energy in mainland China, especially in regions near Hong Kong, would require many well-trained nuclear engineers in foreseeable future.
• The increasing use of radiation technology for medical treatments and diagnosis for aging population means that there is a growing demand in medical radiation professionals.
• Risk engineering is not only essential to the nuclear industry but also to many big corporations and engineering systems. Many companies have now recognized the importance of assessing and managing risks to ensure smooth running of their businesses. Risk professionals are highly sought-after.
• Disaster or crisis management involves dealing with threats after they have occurred. Several well-known disasters and product recalls, such as the lead-in-drinking-water crisis in Hong Kong, Gulf of Mexico oil spill, and major vehicle recalls by Toyota due to out-of-control gas pedals, have highlighted the importance of crisis management for reducing the adverse impacts to businesses and governments. Many petrochemical companies, public utilities companies, banks and big corporations do employ crisis management professionals to protect their businesses from potential crises.

Objectives of the Major

The major aims to equip the students with multi-disciplinary knowledge in nuclear engineering and risk engineering. Besides teaching the discipline-related technical knowledge, we will also help the students develop their problem solving skills so that they can analyze and solve a broad spectrum of engineering problems. The students will gain a sound foundation in the relevant disciplines through practical hands-on projects and extensive exposure to real-life scenarios through industrial placements and overseas exchange arrangements with a view to attaining the dynamic levels and standards required by highly competitive markets such as Hong Kong and mainland China.

Career Prospects

As this major is multi-disciplinary in nature, job prospect is promising. After graduation, students can choose to work in many related professions or industrial sectors, such as power generation industry, materials engineering for large corporations, testing and certification services, medical radiation related fields in hospitals and diagnostic centres, radiation protection and environmental protection in government departments and private consultancy firms, product research and development in nuclear radiation equipment companies, risk assessment in the financial sector, and also disaster management for Government, public utilities companies and big corporations.
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Curriculum

The curriculum has been categorized into eight main programme building blocks:

- General Science and Engineering
- Nuclear Engineering
- Nuclear Medicine and Medical Radiation
- Materials Engineering
- Risk Engineering
- Crisis Management
- Integrative Project
- Language and Out-of-Discipline studies

Innovative teaching approaches will be adopted in the delivery of the curriculum in order to integrate theories with industrial practices. Problem-solving activities, experience-based learning, integrative workshops, industrial attachment, co-operative education, and industry-based projects are typical means to help achieve the targets.

The major requires a total of 120 credit units. Applicants with Associate Degree, Higher Diploma or equivalent qualifications may be admitted with Advanced Standing I or II.

Professional Recognition

This major has been granted provisional accreditation by the Hong Kong Institution of Engineers (HKIE), a signatory member of the Washington Accord, under which all members agree to recognize each other’s accredited engineering degree programmes.

*This major is hosted by the Department of Mechanical Engineering (MNE), in conjunction with the Departments of Chemistry (CHEM), Architecture and Civil Engineering (ACE), Physics (PHY), and Systems Engineering and Engineering Management (SEEM).*