



Mechanical Engineering

Professional Experience Programme (PEP)



BE Degree in Mechanical Engineering

The Mechanical Engineering degree is a four-year honours degree programme. During their first two years, students study scientific subjects such as physics, chemistry, and mathematics, which are required for the development of engineering skills. Core engineering topics such as computing, manufacturing technology and engineering graphics are also studied. In their third and fourth years, students learn the advanced technical skills required in the engineering profession.

Primary areas of undergraduate training

Materials	Metals, alloys, plastics, composites, ceramics, processing technologies, material testing, deformation and fracture.
Mechanical Design	Safety and stress analysis, fatigue, motors and drives, couplings, fasteners, bearings, vibration, pressure vessels, AutoCAD.
Control Engineering	PLCs, systems analysis, electrical and pneumatic control, electro-mechanical systems, machine and assembly languages.
Thermodynamics	Energy, power generation, refrigeration, engines, psychometrics, combustion, heat transfer, heating and ventilation design.
Fluid Mechanics	Internal and external dynamics of liquids and gases, flowfields, pressure distributions, piping losses, boundary layers.
Analysis	Analytical and numerical methods applied to solid, fracture and fluid mechanics, diffusion, convection, conduction, dynamics.
Computing	BASIC, FORTRAN, C, LISP, expert systems, CAD, MATLAB.
Professional development	Communication, management, ethics in engineering.

Final-Year individual projects.

Participating companies have the option of offering students realistic industrial projects which are of specific interest or benefit to their own organisation. These projects may then become the basis of the student's final-year project. Final-Year individual projects account for 25% of the total marks for the year.

Skills acquired

Students have acquired the skills and techniques of modelling, analysing, and designing to professional standards, a wide range of machines, products, mechanical structures and systems using current techniques.

Students can carry out the following roles:

- Design of mechanisms
- - structural components
- - fluid. systems and thermal systems.
- Instrumentation.
- Material selection.
- Material characterisation.
- Materials processing techniques.
- Control systems design and analysis.
- Automation.
- Manufacturing processes.
- Electrical machinery.
- Statistical analysis.
- Medical device regulatory affairs.
- Programming.
- Computer-aided design.
- Finite element analysis.
- Report writing.
- Presentation.
- Energy management.
- Power generation.
- Renewable energy.
- Hydraulic and pneumatic systems.

