University of Pretoria Yearbook 2020

BScHons Engineering and Technology Management (12241073)

Minimum duration of study	1 year
Total credits	128
NQF level	08

Programme information

The BScHons (Engineering and Technology Management) degree is conferred by the following academic department: Engineering and Technology Management.

The stipulations of Faculty Regulations for honours degrees apply mutatis mutandis.

Any specific module is offered on the condition that a minimum number of students are registered for the module, as determined by the relevant head of department and the Dean. Students must consult the relevant head of department in order to compile a meaningful programme, as well as on the syllabi of the modules. The relevant departmental postgraduate brochures must be consulted.

Admission requirements

- An appropriate bachelor's degree in the natural sciences with an average of at least 65%, calculated on the grades of all the final-year modules failed and passed; or an appropriate BTech degree with a minimum average of 65%, calculated on the grades of all the modules, failed or passed.
- The average of 65% is not applicable if the applicant has already completed an honours degree, or a management development programme with a minimum average of 65%.
- A full first year of Mathematics or an equivalent is required.
- The departmental Postgraduate Committee reserves the right to make a thorough assessment of the applicant's academic transcript and to decide if the applicant may be admitted.

Examinations and pass requirements

i. The examination in each module for which a student is registered, takes place during the normal examination period after the conclusion of lectures (i.e. October/November or May/June).
ii. A student registered for the honours degree must complete his or her studies within two years (full-time), or within three years (part-time) after first registration for the degree: Provided that the Dean, on recommendation of the relevant head of department, may approve a stipulated limited extension of this period.
iii. A student must obtain at least 50% in an examination for each module where no semester or year mark is required. A module may only be repeated once.
iv. In modules where semester or year marks are awarded, a minimum examination mark of 40% and a final

mark of 50% is required.

v. No supplementary or special examinations are granted at postgraduate level.

Pass with distinction

A student passes with distinction if he or she obtains a weighted average of at least 75% in the first 128 credits for which he or she has registered (excluding modules which were discontinued timeously). The degree is not awarded with distinction if a student fails any one module (excluding modules which were discontinued timeously). The degree must be completed within the prescribed study period.

Curriculum: Final year

Minimum credits: 128

Core modules

Engineering technology economics 780 (IKN 780)

Module credits	16.00
Prerequisites	No prerequisites.
Contact time	20 contact hours per semester
Language of tuition	Module is presented in English
Department	Engineering and Technology Management
Period of presentation	Semester 1 and Semester 2

Module content

Engineering Economy assists the engineer in making a wide range of decisions. These decisions involve the fundamental elements of monetary cash flow, time, value of money, project life and the interest rate. Engineering Economy calculates the net present worth, future worth, annual equivalent worth and the internal rentability of the cash flows of the alternatives under consideration. By applying these values in different ways, the most economical alternative can be identified. Calculation of these values for a cash flow takes into account the effective interest rate, inflation and the income tax payable.

Technology and innovation management 780 (INV 780)

Module credits	16.00
Prerequisites	No prerequisites.
Contact time	20 contact hours
Language of tuition	Module is presented in English
Department	Engineering and Technology Management
Period of presentation	Semester 1 and Semester 2

Module content

In an increasingly competitive and fast changing business world the management of technological innovation is a key function of organisations that want to prosper. It is therefore important that engineers, scientists and managers understand the fundamental principles of technology and innovation. This module addresses aspects such as the activities and tools of technology management and the processes and dynamics of innovation as important contributors to the creation of new knowledge, products and processes.

Project management 780 (IPK 780)

Module credits	16.00
Prerequisites	No prerequisites.
Contact time	20 contact hours per semester

Language of tuition	Module is presented in English
Department	Engineering and Technology Management
Period of presentation	Semester 1 and Semester 2

Module content

This module addresses basic project management concepts, principles and techniques. The module is aligned with both the U.S. Project Management Institute's Project Management Body of Knowledge (PMBoK) as well as PRINCE2 methodology developed in the UK. Scheduling of projects is a core element of project management and IPK780 covers project scheduling in somewhat more detail and at a more advanced level than the other topics.

The aim of the module is to develop the learner's ability to identify and solve problems in a way that display critical thinking and the application of quantitative methods. The module focuses on project initiation, planning, monitoring and control. Specifically the development of a project plan, different scheduling techniques, earned value, decision making and basic risk management. A deliverable of the module is a project plan (including project scope, WBS, schedule, risk management plan and cash flow) for a project in the learner's work environment.

Research project 780 (ISC 780)

Module credits	32.00
Contact time	20 contact hours
Language of tuition	Module is presented in English
Department	Engineering and Technology Management
Period of presentation	Semester 1 and Semester 2

Module content

The research project is the capstone of the MOT programme. It comprises an independent research study into an area of technology management, applying the principles learned during the programme. Although this is a research project of limited breadth and scope, it nonetheless has to comply with the requirements of scientific research on post-graduate level. The total volume of work that is to be invested in this module by an average student must be 320 hours. Normal requirements for assessment that include the use of an external examiner apply to this module.

Systems thinking and engineering 780 (ISE 780)

Module credits	16.00
Service modules	Faculty of Natural and Agricultural Sciences
Prerequisites	No prerequisites.
Contact time	20 contact hours per semester
Language of tuition	Module is presented in English
Department	Engineering and Technology Management
Period of presentation	Semester 1 and Semester 2

Module content
A company's ability to remain competitive in modern times hinges increasingly on its ability to perform systems engineering. The technology and complexity of a company's products appears to steadily increase and with it, the risks that need to be managed. This module provides specialised knowledge to apply systems engineering by understanding the tools, processes and management fundamentals.

Elective modules

Technological entrepreneurship 780 (IEE 780)

Module credits	16.00
Prerequisites	No prerequisites.
Contact time	20 contact hours per semester
Language of tuition	Module is presented in English
Department	Engineering and Technology Management
Period of presentation	Semester 1 and Semester 2

Module content
Technical solutions can overcome various problems confronting the world, but new business leaders need to emerge by identifying these potential opportunities that can lead to sustainable enterprises with more employment opportunities. The module highlights the role of technology innovation and strategy in entrepreneurship, the development of business models and plan, the lean start-up principle, legal aspects and venture leadership. Entrepreneurship is an intellectual discipline in its own right with its own systematic methods and techniques that can be learned and mastered through professional practice and hard work. This module will equip you with the fundamentals of technological entrepreneurship that can be applied in new ventures or your existing career.

Maintenance and asset management 780 (IMC 780)

Module credits	16.00
Prerequisites	No prerequisites.
Contact time	20 contact hours per semester
Language of tuition	Module is presented in English
Department	Engineering and Technology Management
Period of presentation	Semester 1 and Semester 2

Module content

Every man-made component, spare part, equipment, system or infrastructure has an inherent reliability that is determined by design, construction, installation, manufacture or how it is built. This inherent reliability is influenced by both organisational and physical conditions under which, for example, an item of equipment operates. The operational reliability significantly determines the availability of the equipment. A primary objective of maintenance intervention is to eliminate the operating environment hazards, which reduce the operational reliability of equipment and consequently, the availability of equipment for use. In the event of malfunction or failure, the goal of maintenance is to restore the operational reliability and availability of an item of equipment. Irrespective of whether a maintenance activity is intervening or restorative, it needs to be properly planned, scheduled and executed towards achieving the highest levels of operational reliability and availability, whilst concurrently minimising the expenditure of time and resources. Organisational systems of work (which encompass business processes, culture, and information technology) greatly influence the planning, scheduling and execution of maintenance activities. Furthermore, knowledge of technologies embedded, as well as how various items of equipment malfunction or fail in operation, determines how well the maintenance activities are planned, scheduled and executed. The content of the module not only covers strategies, technical principles, practical processes and systems but also includes standards (e.g., CEN13306) and legislative guidelines that influence the management of maintenance in all industrial sectors. The content will also include an introduction to the ISO 5500x asset management standards.

Operations management 781 (IVV 781)

Module credits	16.00
Prerequisites	No prerequisites.
Contact time	20 contact hours per semester
Language of tuition	Module is presented in English
Department	Engineering and Technology Management
Period of presentation	Semester 1 or Semester 2

Module content

Operations management develops the ability of students to think about the transformation processes in organisations in a global way. The emphasis is on learning how to improve operating systems significantly through maximising throughput and minimising costs. The understanding of operating systems is developed from a flow- as well as an effect-cause-effect perspective.

The information published here is subject to change and may be amended after the publication of this information. The General Regulations (G Regulations) apply to all faculties of the University of Pretoria. It is expected of students to familiarise themselves well with these regulations as well as with the information contained in the General Rules section. Ignorance concerning these regulations and rules will not be accepted as an excuse for any transgression.