University of Pretoria Yearbook 2018

MSc Technology and Innovation Management (Coursework) (12251079)

Minimum duration of study	2 years
Total credits	180

Programme information

- Unless the Dean, on recommendation of the relevant head of department, decides otherwise, the master's degree is conferred on the basis of examinations of coursework and a mini-dissertation (including an examination on the mini-dissertation).
- A minimum of 180 credits is required to obtain the MSc degree. A mini-dissertation (60 credits) and coursework (120 credits) is included in the programme.
- Recognition is not granted for credits acquired during studying for the BEngHons or the BScHons.
- The curriculum is determined in consultation with the relevant head of department. Any specific module is offered on condition that a minimum number of students are registered for the module, as determined by the head of department and the Dean. Students must consult the relevant head of department in order to compile a meaningful programme, as well as for information on the syllabi of the modules. The various departmental postgraduate brochures should also be consulted.

Admission requirements

The admission requirement for the MSc is a MSC (Hon) or equivalent qualification. A selection procedure takes place prior to admission to the Masters degree. Restrictions may be placed on the number of students admitted. Postgraduate selection takes place as stipulated in the respective departmental rules. (click here)

Examinations and pass requirements

The stipulations of the relevant Faculty regulations are applicable.
Guidelines for the preparation and examination of mini-dissertations are available from the department.

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 masters degree must complete his or her studies within three years 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.

Research information

A student must by means of a mini-dissertation prove that he or she is capable of planning, instituting and executing a scientific investigation. As part of the examination a student must submit an article and present at the final year symposium. The article should be based on the research that the student has conducted for the dissertation and be approved by the supervisor. Conferment of the degree may be made subject to compliance with the stipulations of this regulation.

Pass with distinction

A student who completes the master's degree on grounds of coursework and a mini-dissertation, passes with distinction if a weighted average mark of at least 75% is obtained in the first 180 credits obtained for the degree provided that 60 of these credits are allocated to the mini-dissertation. However, the degree is not awarded with distinction should a student fail any of these modules (excluding modules which have been timeously discontinued). The degree is also not awarded with distinction if a student obtains less than 70% for the mini-dissertation.

Curriculum: Year 1

Minimum credits: 120

Core modules

Decision analysis 880 (IBD 880)

Module credits	10.00
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 or Semester 2

Module content

Techno-economics analysis (TEA), also referred to as economic feasibility studies, is a core technique which is used to support decision making in all for-profit organisations and sometimes more broadly in the public sector. The fundamental principle of the analysis is that only investments or projects which show a positive return on investment should be approved and implemented. Although stated simply, this principle is complex to apply since it changes according to the manner in which costs and income are accounted or measured. The simplest approaches use the generic models of net present values, discounted cash flows, internal rates of return and the time value of money to compare expenses against earnings. In this module, the student will be given an introduction to the principles of techno-economics and the structure of TEA. This introduction will be followed by material on the core calculations of TEA, including present value, future value and return. The students will be required to apply the initial TEA structure to a class project in order to acquire the basic knowledge with which such an analysis can be completed, and as a consequence, how to guide decisions relating to investment in future projects.

Technological intrapreneurship 880 (IEE 880)

Module credits	10.00
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 or Semester 2

Module content

Technological Intrapreneurship or Corporate Entrepreneurship (CE) refers to the means by which an organisation revitalises itself and alter its competitive contour through embarking in entrepreneurial activities which focus on innovation. CE is one of the key tools to take organisations forward in an environment faced by global challenges. This module focuses on the fundamentals of CE, how to design an entrepreneurial organisation, building cultures to support technological intrapreneurship and enable continuous intrapreneurial performance within a corporation

Technology commercialisation 881 (IKG 881)

Module credits	10.00
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

The survival of modern companies increasingly depends on the development and successful commercialisation of new products and services. The module is designed to address the principles embedded in the process of identifying, transferring and commercialising inventions and knowledge within the context of national systems of innovation. The intention is to integrate the functional elements of innovation management with emphasis on the entrepreneurial process of commercialising new methods, practices, processes, products, services, systems and technology towards the generation of economic growth, wealth and prosperity.

Literature study 801 (ILS 801)

Module credits	10.00
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 2

Module content

The overall objective of this module is to provide students with sufficient knowledge and skills to undertake a detailed and comprehensive literature review. This module is an integral part of the research component and will be aligned with the research proposal of the student. The major part of the module consists of individual self-study done by the student outside the classroom in his/her own time, complemented by student-centred and co-operative learning/teaching methods during lectures. The self-study includes prescribed reading and individual assignments.

Research methodology 800 (INI 800)

Module credits	10.00
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
The overall objective of this module is to provide students with sufficient knowledge and skills to undertake independent research for a masters' dissertation. The major part of the course consists of individual self-study done by the student outside the classroom in his/her own time, complemented by student-centred and co-operative learning/teaching methods during lectures. The self-study includes prescribed reading, individual assignments and preparation for the examination.The lecturer will act as a guide to the students to acquire the necessary knowledge and skills through self-study and practical exercises, in addition to formal lecturers.

Organisation and innovation 880 (INV 880)

Module credits	10.00
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 or Semester 2

Module content
This module has been designed for master’s students wishing to build substantive and methodological knowledge in two profound and related disciplines and phenomena: organisation studies and innovation studies. It focuses on providing an overview of the main concepts, theoretical perspectives and models regarding organisation, technological innovation and the relationships between different forms of organisation and technological innovation (e.g. organising for creativity; systems supporting innovation). This module further explains innovation at several levels of analysis (individuals, teams, organisations, sectors, nations). Students are expected to apply the acquired knowledge in their workplace.

Project management 804 (IPK 804)

Module credits	10.00
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 or Semester 2

Module content
The nature of projects and project management. The project life cycle and project phases. Organisational aspects of project management. Project teams and roles. Responsibility matrixes. Processes and methodologies for planning and control: Initiating the project, Scope planning, Scope definition and the WBS, Scope verification and work authorisation. Scheduling: Stochastic PERT, CPM time-cost tradeoffs and critical chain.Resource planning and scheduling of multiple projects and scheduling of multiple projects. Cost estimating, project budgeting and project cash flow. The control process. Performance analysis: earned value and performance indices. Project closure: evaluation, reporting and termination. Project management information systems. Project closure and continuing improvement. Reasons for project successes and failures.

Science, technology and innovation policy 880 (ISP 880)

Module credits	10.00
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 or Semester 2

Module content

Science, Technology & Innovation (STI) Policy is considered to drive innovation and innovation is considered to be a core contributor toeconomic growth in all countries. As a result, STI policy is critical to the effective generation and utilisation of STI knowledge, whether this beundertaken for public good or private gain. In this module the student willbe given an introduction to, and the linkage between, Science and Technology, research and development, and innovation. This introduction will be followed by a brief history of innovation theory and how S&T links to both national and technological innovation systems. The range of policy instruments which can be used to stimulate science, technology andinnovation will then be reviewed, followed by the characterisation of the instruments which are presently adopted in South Africa. The student will then be presented with a range of frameworks to allow the analysis of different S&T policies and innovation systems, with particular reference to South Africa and other countries in the region.

Technology management 802 (ITB 802)

Module credits	10.00
Prerequisites	No prerequisites.
Contact time	20 lectures per week, 22 other contact sessions per week
Language of tuition	Module is presented in English
Department	Engineering and Technology Management
Period of presentation	Semester 1 or Semester 2

Module content

The module aims to provide students with insight into the concept of technology and the utilisation thereof in the business environment. The module provides theory and application skills on the operational level. Themes addressed are: Theory of technology, Technology forecasting and dynamics, Technology audits, Technology planning and Technology acquisition. The themes form part of the portfolio of technology management activities that organisations should be able to master in order to be competitive.

Curriculum: Final year

Minimum credits: 60

Core modules

Financial management 831 (FBS 831)

Module credits	16.00
Service modules	Faculty of Engineering, Built Environment and Information Technology
Prerequisites	No prerequisites.
Contact time	1 lecture per week
Language of tuition	Module is presented in English
Department	Financial Management
Period of presentation	Semester 1

Module content

"The goal of a firm is to maximise the long-term wealth of its shareholders." Why do most management experts generally accept this statement? How do all the other objectives of a firm relate to this goal? Why is the success of most companies measured in financial terms? In FBS 831 answers to these questions are sought. The nature of and interaction between different financial statements are investigated, as well as their role in the creation of shareholder wealth. Although maximising shareholder wealth is the basic general cornerstone of management, recent developments point out that non-quantitative factors are also important in the measurement of company performance.

New product development 880 (INP 880)

Module credits	10.00
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 or Semester 2

Module content

The development of new products is a very important activity within a firm. There is always a high risk of failure but the best companies manage to bring out successful new products on a continuous basis. The module introduces the processes, tools and techniques and strategies used by leading-edge companies for new-product development. It examines different stages of product development, from idea generation to market testing and includes the assessment and selection of appropriate business models. Fourth industrial revolution technologies are considered as well.

Mini-dissertation 898 (ISC 898)

Module credits	60.00

Prerequisites	No prerequisites.
Language of tuition	Module is presented in English
Department	Engineering and Technology Management
Period of presentation	Year

Module content

The research component is the capstone of the MTM programme. It comprises an independent research study into an area of engineering, project or technology management, applying the principles learned during the programme. Although not a full master's dissertation, it is essential to produce something original and useful, both to an academic field in the respective programmes and to the public/private sector that searches for solutions. Although this is a dissertation of limited breadth and scope, it nonetheless has to comply with the requirements of scientific research.

Strategic technology and innovation management 880 (IST 880)

Module credits	10.00
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 or Semester 2

Module content

The objective of this module is to provide students with the necessary skills to develop technology and innovation strategies for organisations. Themes include the concepts of technology and innovation strategy, processes of strategic management, formulation of technology and innovation strategies, strategy implementation, technology roadmapping, scenario development and future thinking. Appropriate case studies are used to link the theory and practice.

People management 884 (PEM 884)

Module credits	16.00
Service modules	Faculty of Engineering, Built Environment and Information Technology
Prerequisites	No prerequisites.
Contact time	1 web-based period per week, 16 lectures per week, 3 discussion classes per week
Language of tuition	Module is presented in English
Department	Human Resource Management
Period of presentation	Semester 1

Module content

While the cliché “Our company’s most important asset is our people” is often used, the aim of the PEM 884 module is to bring life to this statement, equipping managers in the technology environment to manage people in a way that enhances both their value and humanity. The module centres around challenges in the technology environment for the 21st century, considering how organisational behaviour and human resource management processes can be used in mastering these. The module includes aspects such as managing individuals, teams and organisations with regard to various dimensions of behaviour including: individual diversity, emotional intelligence, motivation and team performance, group dynamics in managing teams, communication, leadership, power and politics, organisational culture, organisational change and stress, labour relations and human resource processes.