DESCRIPTION OF MODULES: Honours in Engineering and Technology Management

Asset Management IBB 780 (16 credits)

The ISO 55000 standard (under development) defines an Asset as "something that has potential or actual value to an organization". The value will vary between different organizations and their stakeholders. Value can be tangible or intangible, financial or non-financial. Asset Management is defined as "the set of coordinated activities that an organization uses to realize value from assets in the delivery of its outcomes or objectives." Realization of value requires the achievement of a balance of costs, risks and benefits, often over different timescales. The overall objective of this module is to apply the basic principles of planning, organisation, leading and control to the management of assets, in particular engineering assets. This includes aspects such as support, operation, performance evaluation and continual improvement. Current standards (e.g. ISO 55000), guidelines (e.g. PAS-55) and other government documents on asset management are also addressed in this module.

Engineering Techno Economics IKN 780 (16 credits)

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 INV 780 (16 credits)

Organizations innovate by undertaking activities aimed at the discovery and successful commercialization of new products, processes, services, and technologies. Innovation strategy allows organizations to make essential decisions regarding the nature, choice and timing of such innovation activities and the way they are organized. The module starts with defining its main building blocks: innovation, technology and organization. Next, we will look into types of innovation and innovation models, and the nature and processes of technological change. The main emphasis of this module will be on the strategic organization and management of innovation at different levels: teams, networks and systems of innovation.

Maintenance Management IMC 780 (16 credits)

The ageing of production assets, process plants, assembly plants, power generation systems and mining machinery, as well as the increasing cost of maintenance has prompted many organisations to view the management of the maintenance process as a higher priority. Neglecting maintenance will cause rapid deterioration of assets and have a negative impact on the company's bottom line. The management of maintenance requires a professional approach due to the complexity of the resources, modern technology and processes involved. The main focus of this module is to establish a holistic focus on the maintenance process, and to enable students to analyze the improvements

required using first principles, and other related techniques. A major outcome is the development of a maintenance configuration.

Operations Management IVV 781 (16 credits)

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 maximizing throughput and minimizing costs. The understanding of operating systems is developed from a flow- as well as an effect-cause-effect perspective.

Project Management IPK 780 (16 credits)

Project management forms part and parcel of the work of almost all engineers. It is also the fastest growing form of management worldwide. Project Management IPK 780 has been designed to provide a sound introduction to the basics of project management, including project risk management. It furthermore addresses project scheduling at a more advanced level.

Systems Thinking and Engineering ISE 780 (16 credits)

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.

Technological Entrepreneurship IEE 780 (16 credits)

The module offers prospective students exposure to a systematic business value creation through innovation and entrepreneurship in the technological domain in two ways; firstly it creates an understanding of theoretical legacy behind entrepreneurship, and secondly, it develops practical entrepreneurship platform and business management skills such as the formulation of business plan, understanding of entrepreneurial financing and management of business growth. Participants will insightfully experience that Technological Entrepreneurship, like innovation 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. Entrepreneurs believe in their abilities to turn business obstacles into opportunities.

Research Project IGB/ISC 780 (32 credits)

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.