Systems thinking 801 (IBI 801)

Qualification	Postgraduate
Faculty	Faculty of Engineering, Built Environment and Information Technology
Module credits	10.00
NQF Level	09
Programmes	MEng Engineering Management (Coursework)
	MEng Project Management (Coursework)
	MEng Technology and Innovation Management (Coursework)
	MSc Engineering Management (Coursework)
	MSc Project Management (Coursework)
	MSc Technology and Innovation Management (Coursework)
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 modern world consists of "systems". This is evident from everyday discussions. Statements such as "The system failed us", or "The national energy system is under pressure" abound. Most people have little or no understanding of what a system is, or how to deal with it. Digging deeper into the concept of "system" leads one to realise that engineers and scientists without any working knowledge of "systems thinking", or as some describe it, "thinking in systems", rarely succeed when attempting to solve the problems of our time mainly because they do not know how to deal with trending patterns. Peter Senge, author of the book The Fifth Discipline and well-known systems thinker, defines systems thinking as "both a thinking skill and a language for understanding and working with complexity". This module will provide you with the know-how and tools to achieve the desired outcomes in your real-world environment, notably when that world includes complex and wicked problems. The real-world in this case includes people as well. This module will challenge almost everything you have been taught to date. After completing this module you will view the world in a different way. You will become a big-picture thinker who can transcend your own discipline with ease. The module includes the history and benefits of systems thinking, systems thinking terminology, managing interrelationships, overview of appropriate tools and methodologies including system dynamics, soft systems methodology, systemigrams, etc. These will be illustrated further by applying them to relevant case studies. This module is the ideal complement to systems engineering, which focuses mainly on hard systems whereas systems thinking focuses on soft systems.

The role of projects in realising (more) sustainable business strategies and a more sustainable society is one of the emerging topics in project management. From the literature on this topic, two types of relationship between sustainability and project management appear: the sustainability of the project's product, the deliverable the project realises, and the sustainability of the project's process of delivering and managing the project. The first relationship, sustainable projects, is well studied and addressed, for example in relationship to eco-design and 'green' construction. The second relationship, sustainable project management, is emerging as a new 'school of thought' in project management.

As project managers play a pivotal role in the sustainability of their projects, this module will discuss the 'why?', 'what?' and 'how?' of sustainable project management. The lectures will discuss the concepts of sustainability, the role of projects in sustainability, the impact of sustainability on project management, the integration of sustainability in the project management process and the structure of a 'Sustainability Management Plan'.