Why this Course?

Complexity characterises the world and all human endeavours today – in business, government, social, natural, scientific, health, engineering and political spheres. Local and global problems and challenges can no longer be viewed and solved with narrow single dimensional mindset and tools.

“Globally effective graduates” and future leaders will need to understand and manage complexity and how to deal with it in multi-stakeholder situations. Systems Thinking is the science of integration. It provides a scientific ‘language’ and set of tools for understanding complexity and multi-stakeholder decision making.

This course introduces concepts and tools of Systems Thinking and System Dynamics to deal with complexities arising from interdependencies and interactions amongst various strategies, decisions and interventions related to natural, business, social and political systems.

Students are exposed to both qualitative and quantitative approaches and tools in the course to gain insights into how complex systems work and to foresee the intended outcomes as well as the unintended consequences of decisions and interventions.

The course is relevant and critical to all disciplines and majors (bio-physical, natural and social science, business and economics, healthcare, engineering, architecture, etc). Group projects based on real cases provide a unique multi-disciplinary learning opportunity for students who wish to broaden their horizon and gain first hand experience with current real world problems.

Goals of the Course

The course is designed to help students develop a holistic view of the world, as well as knowledge and skills for dealing with complex problems. The aim is to help students to learn and ‘internalise’ that the “whole is greater than the sum of its parts” and that the interactions of the parts of a system determine the dynamic behaviour of systems of all kinds.

Learning Outcomes

Upon successful completion of the course, students will be able to:

1. Appreciate the nature of complexity underlying systems of all kinds
2. Understand the forces that shape the behaviour of complex systems (i.e. growth, decline, instability, oscillation) and why and how vicious cycles are generated within a system
3. Identify key variables/factors affecting systems and model the dynamic interactions that underlie complex behaviour
4. Identify leverage points for systemic interventions in systems and interpret their managerial and practical implications
5. Understand the role and power of mental models in shaping decisions and actions
6. Apply concepts and tools of Systems Thinking and Modelling to natural, social, business, and policy decisions.

This course is designed for students and professionals from ALL disciplines! It is a fun and powerful capstone course for your degree.
General information

Teaching/Learning Modes
The course will utilise a variety of learning and teaching approaches including, lectures, case studies, small-group discussion, workshops, videos, and learning laboratories. Group projects based on real world problems are an important part of the learning experience.

Class Time/Venue
Wednesdays
Campus: St Lucia Campus
Computer Lab: TBA

Learning Resources
Textbook:
Systems Thinking System Dynamics – Managing Change and Complexity

Supplementary Readings:
An electronic copy (PDF and Word formats) of supplementary readings and websites will be provided on Blackboard.

Assessment
Assignments  25
Group Project  35
Mid-term test (open book)  40

100

Group Project
The group project is a case study related to a real situation (company, government policy, business strategy, etc.) which uses the concepts and tools learned in the course. There is a wide scope with respect to the project topic/area. Generally speaking, any problem, policy, situation or issue related to business, industry, government or society may be considered. For example topics could include impacts of climate change, issues related to sustainability, value chain dynamics in business, agriculture, effects of government policies on healthcare, unemployment, welfare, education, solving an engineering problem, integrated and effective planning, etc.

Prerequisite
No formal prerequisite will be required (by consent of the lecturer).

Who should attend?
This course is designed for students and professionals from ALL disciplines. Undergraduate students will find this to be a fun and powerful capstone course for their degree. While the course teaches systems modelling at an introductory and conceptual level, no prior background in computer modelling is required.

Contact
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