

Module Code	TG-2308		
Module Title	Fundamentals of System Design and Analysis		
Degree/Diploma	Bachelor of Engineering		
Type of Module	Major Option		
Modular Credits	2	Total student Workload	4 hours/week
		Contact hours	2 hours/week
Prerequisite	None		
Anti-requisite	None		
Aims			
<p>The module introduces students to the systems thinking process and the fundamental considerations associated with systems engineering. These include systems modelling and design, system development process, needs analysis, concept exploration, concept definition, engineering design, integration and evaluation, and systems engineering management. The module provides students with a disciplined approach for identifying a customer or stakeholder need and translating that need into a complete set of requirements or specifications for a system that meets the need. The course helps students understand how to think through the choices at each step of the process, including the decisions that have to be made and the factors governing them.</p>			
Learning Outcomes			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order:	10%	<ul style="list-style-type: none"> - recall the definitions and classifications of systems, the hierarchical models of complex systems and systems of systems (SoS) - relate to the systems thinking ideas and evaluate systems engineering tools 	
Middle order :	10%	<ul style="list-style-type: none"> - analyse functional and information modelling for complex systems - explain the engineering and design of large-scale systems 	
Higher order:	80%	<ul style="list-style-type: none"> - visualise issues and constraints of systems design - create and appraise system of systems (SoS) models - justify the use of models for certain developmental projects 	
Module Contents			
<ul style="list-style-type: none"> - Definitions and classification of systems, hierarchical models of complex systems, and systems of systems (SoS) - Systems thinking ideas and systems engineering tools, - Functional And Information Modelling For Complex Systems, - Engineering and design of large scale systems, including the system development process, system life cycle models (DoD, ISO/IEC, NSPE), and systems engineering documents, - Formulation of issues and constraints, from needs analysis, concept exploration, through to concept definition, - Design and evaluation of SoS models, from advanced development, engineering design, to system integration and evaluation 			
Assessment	Formative assessment	Monthly online multiple choice questions will be used to test and to give feedback for their learning	
	Summative assessment	Examination: 0% Coursework: 100% <ul style="list-style-type: none"> - 3 individual assignments (20% each) - 2 oral presentations (20% each) 	