Subject Description Form

Subject Code	ME577								
Subject Title	Advanced Aircraft Structures								
Credit Value	3								
Level	5								
Pre-requisite/ Co-requisite/ Exclusion	Exclusion: AAE5202 Advanced Aircraft Structures and Materials								
Objectives	To provide students the key knowledge relevant to the structures and composite materials in aircraft; to provide students with tools of stress analysis to formulate and solve engineering problems in aircraft structures.								
Intended Learning	Upon completion of the subject, students will be able to:								
Outcomes	a. demonstrate a good understanding of key aspects of aircraft structures, components and systems;								
	b. analyze an aircraft structure subject to a combined state of loading using stress analysis tools;								
	c. apply failure criteria to analyze an aircraft structure subject to loading;								
	d. formulate and solve problems con and buckling in aircraft structures;	ncerning compression/tension, bending, torsion							
	e. understand mechanical behaviors	of composites used in aircraft;							
	bads or displacement boundary conditions on								
	g. gain appreciation of the wide design flexibility composites in aircraft.								
Subject Synopsis/ Indicative Syllabus	oject Synopsis/ licative SyllabusCharacteristics of Aircraft Structures and Materials: Structural elements in ai Wing, fuselage, tail and landing gear. Aircraft materials.Elasticity: stress-strain relations. Elastic strain energy. St. Venant's principle. Thin plate the								
	Loads Applied on Aircraft: Compression/tension. Torsion. Bending. Closed single- cell thin-walled sections. Transverse shear stress. Flexural shear in thin-walled sections and in open thin-walled section. Buckling of columns. Aircraft structures under combined loading.								
	<i>Failure Criteria for Isotropic Materials:</i> Strength criteria for brittle material criteria for ductile materials. Fracture mechanics. Stress intensity factor. Fatigu <i>Aircraft Composites:</i> Classification and characteristics of composite m Mechanical behavior of composite materials. Interface properties. Process Fabrication techniques for aircraft composites. Analysis of Lamina and La Failures of composites.								
Teaching/Learning Methodology	Lectures are used to deliver the fundamental knowledge in relation to aircraft structures and composites (outcomes a to g).								
	Tutorials are used to illustrate the approximation (outcomes a to g).	oplication of fundamental knowledge to practical							
	Teaching/Learning Methodology	Intended subject learning outcomes							
	Lecture	a b c d e f g							
	Tutorial								

Assessment Methods in Alignment with	Specific assessment	%	Intended subject learning outcomes to be assessed								
Intended Learning	methods/tasks	weighting									
Outcomes			a	b	c	d	e	f	g		
	1. Examination	50%	N	N	N	N	V	N	N		
	2. Assignment and test	50%		\checkmark	\checkmark						
	Total	100%									
	Explanation of the appropriateness of the assessment methods in assessir intended learning outcomes:										
	ous Assessment										
	Examination is adopted to assess students on the overall understanding and the abili of applying the concepts. It is supplemented by continuous assessment includin assignments and closed-book tests. The continuous assessment is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus.										
	All assigned homework independently. It is the stu and to ask questions on otherwise, no group subm score will be assigned.	ed homework inclusive of any computer problems should be worked ntly. It is the students' responsibilities to work out the problems individually a questions on those problems they have difficulty with. Unless stated no group submission or copies are permitted. If a copy is detected, a zero be assigned.									
Student Study Effort	Class contact:										
Expected	Lecture					24 Hrs.					
	 Tutorial/Case Study 		15 Hrs.						5 Hrs.		
	Other student study effort:										
	Course work					42 Hrs.					
	Self-study					25 Hrs.					
	Total student study effort							10	6 Hrs.		
Reading List and References	 C.T. Sun, Mechanics of Aircraft Structures, John Wiley & Sons, 1998. T.H.G. Megson, Aircraft Structures for Engineering Students, Elsevier, 2007. R.F. Gibson, Principles of Composite Material Mechanics, McGraw-Hill International Editions, 1994. I. Moir and A.G. Seabridge, Design and Development of Aircraft Systems – An Introduction, AIAA Education Series, 2004. 										