



UNIVERSITI TEKNOLOGI MARA

AAR553: STRUCTURAL THEORIES AND APPLICATIONS

Course Name (English)	STRUCTURAL THEORIES AND APPLICATIONS APPROVED
Course Code	AAR553
MQF Credit	2
Course Description	This course covers the application of structural theories in architecture and building. The topics cover the study of forces, section properties, and strength of materials and analysis of main building components including roof structure, columns and beams.
Transferable Skills	Systematically Inquisitive Expert in Field
Teaching Methodologies	Lectures, Tutorial
CLO	CLO1 Describe the study of forces, section properties, and strength of materials for simply supported structures. CLO2 Illustrate the understanding on the action of forces and moment in simple structural form.
Pre-Requisite Courses	No course recommendations
Topics	
1. Introduction 1.1) Introduction to structural analysis, theories and components in building structures. 1.2) Units, symbols and definitions.	
2. Forces 2.1) Finding resultant forces 2.2) Parallelogram of forces 2.3) Forces in equilibrium 2.4) Moment of forces 2.5) Loading on structures	
3. Section properties 3.1) Centre of gravity, first moment of area and second moment of area. 3.2) Section modulus	
4. Strength of material 4.1) Direct stress/strain relationship 4.2) Properties of materials 4.3) Hooke's law. Ultimate stress, lower yield and upper yield 4.4) Young's modulus for steel, timber, concrete and other materials.	
5. Roof structures 5.1) Introduction to roof structure 5.2) Types of roof trusses 5.3) Perfect, imperfect and redundant framed structures	
6. Beam 6.1) Introduction 6.2) Types of beam 6.3) Types of loading 6.4) Shear force diagrams and bending moment diagrams.	
7. Column 7.1) Introduction 7.2) Short and slender column 7.3) Load transferred to column.	

8. Introduction to timber structure

- 8.1) Structural timber in building construction
- 8.2) Timber floors
- 8.3) Timber structural system (framing)
- 8.4) Trusses design

Assessment Breakdown	%
Continuous Assessment	40.00%
Final Assessment	60.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Test	Assessment on the understanding of forces, section properties, and strength of materials for simply supported structures.	40%	CLO1

Reading List	Reference Book Resources	<ul style="list-style-type: none"> • B.N Sandaker 2008, <i>On Span and Space: Exploring structures in ar</i>, Routledge • M.Millais 2005, <i>Building Structures: From Concept to Design</i>, Taylor & Francis • A.Charleson 2005, <i>Structures as Architecture: A source book for</i>, Elsevier • Macdonald, A.J 2001, <i>Structures and Architecture</i>, Oxford, Architecture Press • Zulkifli M.S 1991, <i>Pengenalan Analysis Structure</i>, DBP
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	