



UNIVERSITI TEKNOLOGI MARA

BCM422: STRUCTURES I

Course Name (English)	STRUCTURES I APPROVED
Course Code	BCM422
MQF Credit	2
Course Description	This course introduces to students the fundamental of applied mechanics primarily in the basic design analysis for simple building structures. It covers the principles of moment, centre of gravity, drawing shear force and bending moment diagrams, stress and strain relationship and deflection in beams
Transferable Skills	Construction Technology Skill Problem-Solving Skill
Teaching Methodologies	Lectures, Tutorial
CLO	CLO1 Evaluate structural principal for moment, stress and strain, shear force and bending moment diagram, center of gravity and properties of section CLO2 Define the stress and strain relationship of building materials, principal of moment, shear force, and bending moment, centre of gravity, properties of section and principal of parallel axis. CLO3 Demonstrate good ethics in basic design analysis for simple building structures
Pre-Requisite Courses	No course recommendations
Topics	
1. General overview on structural behaviour 1.1) Types of loading, support, structure and material 1.2) Behaviour of beams, columns, trusses, walls and foundations	
2. Principles of Moments 2.1) Condition of equilibrium 2.2) Simple lever system 2.3) Calculation of reactions to simple beams	
3. Center of gravity 3.1) Common figures and their locations of centre of gravity 3.2) Calculating centre of gravity to irregular figures by moment 3.3) techniques 3.4) Calculating centre of gravity to hollow structures	
4. Shear Force and Bending Moments Diagram 4.1) Techniques of drawing the diagram 4.2) Relation between the diagrams 4.3) Maximum bending moment 4.4) Point of contra-flexure 4.5) Sign convention 4.6) Identify the relationship between negative (hogging) and 4.7) positive (sagging) bending and, positive and negative shear of a simple beam	
5. Properties of Section 5.1) Moment of Inertia (I) / Second Moment of Area 5.2) Principles of Parallel Axes	
6. Stress, Strain and Modulus of Elasticity Relationships 6.1) For homogeneous beam section 6.2) For composite beam section	

7. Deflection of Beams

7.1) Factors affecting deflection

7.2) Checking for permissible deflection for beam design

Assessment Breakdown	%
Continuous Assessment	40.00%
Final Assessment	60.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Tutorial on principal of structures	30%	CLO3
	Test	Test 1 on Principal of moment, shear force and bending moment Test 2- on Center of gravity and properties of section	10%	CLO2

Reading List	Recommended Text
	<ul style="list-style-type: none"> • G.B. Vine 2003, <i>Structural Analysis</i>, Longman • R.E. Shaefer 2002, <i>Elementary Analysis</i>, Prentice - Hall Inc • D.T. William, W. Morgan, T. Durka 2006, <i>Structural Mechanics</i>, 6th Ed., Pitman • R. Whitlow 1973, <i>Material and Structures</i>, Longman

Article/Paper List	This Course does not have any article/paper resources
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Other References	This Course does not have any other resources
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