



UNIVERSITI TEKNOLOGI MARA

AAR503: INTRODUCTION TO STRUCTURES

Course Name (English)	INTRODUCTION TO STRUCTURES APPROVED
Course Code	AAR503
MQF Credit	2
Course Description	The first part of the course deals with the application of mathematical principles and theories of structures, which covers topics on circles, arcs, co-ordinate geometry, quadratic equations, and the concept of differentiation and integration. The second part is an introductory study of static which includes scalar, vector, units, collinear and concurrent forces.
Transferable Skills	Systematically Inquisitive Expert in Field
Teaching Methodologies	Lectures, Tutorial
CLO	CLO1 Explain the relationship between applied mathematics and structures, and theory of forces. CLO2 Demonstrate the understanding of structural concepts (coordinate geometry, quadratic equations, differentiation and integration,).
Pre-Requisite Courses	No course recommendations
Topics	
1. Circle and Arcs 1.1) Angle in radian, area and perimeters of plain figures.	
2. Coordinate geometry 2.1) Equation of straight line, distance between two points, middle point, slope and equations of parallel and perpendicular lines. Form of the straight-line equation.	
3. Quadratic equations and square roots 3.1) Quadratic equations by factoring and quadratic formula.	
4. Differentiation 4.1) Differentiation of functions - recognizing derivatives of standard functions including axn. Rules of differentiation (dy/dx and d ² y/d ² x)	
5. Integration 5.1) Integration as a reverse of differentiation and method of integration by substitution and by parts.	
6. Introduction to mechanics in structures 6.1) Types of Loads; Units related to structure measurements, symbols and their definitions. 6.2) Concurrent Coplanar Forces, Resultant, Triangle of Forces, Polygon. Non Concurrent Coplanar Forces. 6.3) Exercises given shall be accompanied by demonstrations / model making to further illustrate the principles.	

Assessment Breakdown	%
Continuous Assessment	40.00%
Final Assessment	60.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Test	n/a	20%	CLO1
	Test	n/a	20%	CLO2

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 • H. Al Nageim, T.J MacGinley 2005, <i>Steel structures: practical design studies</i>, Taylor & Francis • Macdonald, A.J 2001, <i>Structure and Architecture</i>, Oxford, Architecture Press
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	