



UNIVERSITI TEKNOLOGI MARA

BCT613: ADVANCED CONSTRUCTION MATERIAL

Course Name (English)	ADVANCED CONSTRUCTION MATERIAL APPROVED
Course Code	BCT613
MQF Credit	3
Course Description	The course introduces approaches and design towards developing an understanding of the behavior of concrete and other materials in existing structures especially aspects related to durability and deterioration in tropical environments and elementary understanding of construction materials and processes used in construction.
Transferable Skills	Knowledge, soft skills, practical skills
Teaching Methodologies	Lectures, Lab Work, Collaborative Learning, Project-based Learning
CLO	<p>CLO1 Explain the properties of advance construction materials used in the construction industry.</p> <p>CLO2 Display the practical skills in testing the strength of concrete materials used in the construction industry.</p> <p>CLO3 Propose advance construction materials that have a commercial values which can be marketable and compete in the construction industry.</p>
Pre-Requisite Courses	No course recommendations
Topics	
1. 1. Properties of Structural Concrete	
1.1) Properties of cement, aggregate, admixtures, water	
2. 2. Concrete Mix Design	
2.1) Principles of concrete mix design 2.2) DOE mix design method 2.3) Detail of testing (density test, flexural & compressive strength test, ultrasonic pulse velocity test, shrinkage test, oxygen 2.4) permeability test)	
3. 3. Development of Ferro-cement Technology (
3.1) Uses of ferro-cement 3.2) Properties of ferro-cement 3.3) Construction procedure of ferro-cement	
4. 4. Puzzolanas	
4.1) Properties of puzzolanas 4.2) The application of puzzolanas	
5. 5. Building Mortars	
5.1) Classification of mortar 5.2) The application and testing of mortar	
6. 6. Gypsum	
6.1) Classification of gypsum 6.2) The application of gypsum in construction	
7. 7. Autoclaved Aerated Concrete	
7.1) Autoclaved aerated concrete as a green building material 7.2) Properties of autoclaved aerated concrete 7.3) The manufacturing process 7.4) Advantages and disadvantages of building with autoclaved aerated concrete	

8. 8. Lightweight Concrete

- 8.1) Types of lightweight concrete
- 8.2) Properties of lightweight concrete
- 8.3) Application of lightweight concrete
- 8.4) Advantage and disadvantage
- 8.5) Foam concrete mix design

9. 9. Clay Brick

- 9.1) Types of clay
- 9.2) Manufacturing process of clay brick
- 9.3) Properties of clay brick
- 9.4) Advantages and disadvantages of clay brick

10. 10. Rocks and stones

- 10.1) Types of rock and stones
- 10.2) Usage in construction
- 10.3) Advantage and disadvantages of rock and stones

Assessment Breakdown	%
Continuous Assessment	100.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Individual written assignment (Submission online)	30%	CLO1
	Group Project	Group project report Propose advance construction materials that have a commercial values	30%	CLO3
	Lab Exercise	Group written report	20%	CLO2
	Presentation	Individual video/online presentation	20%	CLO1

Reading List	Recommended Text	<ul style="list-style-type: none"> • Taylor, G., D 2000, <i>Materials in construction</i>, Longman • Grosse, C., U. 2007, <i>Advances in Construction Materials</i>, Springer • Reeves, G., M., et al 2006, <i>Clay Material Used in Construction</i>, Geological Society • Aroni, S. 1993, <i>Autoclaved aerated concrete: properties, testing, and design</i>, Taylor & Francis • Zongjin Li 2011, <i>Advanced Concrete Technology</i>, John Wiley & Sons
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Article/Paper List	This Course does not have any article/paper resources
Other References	This Course does not have any other resources