UNIVERSITI TEKNOLOGI MARA

BCM414: CONSTRUCTION TECHNOLOGY I

Course Name (English)	CONSTRUCTION TECHNOLOGY I APPROVED
Course Code	BCM414
MQF Credit	4
Course Description	The general aims of this course is to provide sufficient knowledge and understanding of the basic principles in building construction and materials. The course covers the element of works to be done at an early stage of construction which include construction industry overview, site and soil investigation, setting out, foundation, concrete framed structure, brick and block walls, emphasis on the technology and installation of the element.
Transferable Skills	Construction technology skill Teamwork skill Communication skill Information management skill
Teaching Methodologies	Lectures, Blended Learning, Lab Work, Studio, Field Trip, Tutorial, Presentation
CLO	CLO1 Assess principles of building construction and materials for construction projects. CLO2 Present with confidence and responsive in presenting findings and ideas on construction materials. CLO3 Identify relevant information in determining various building facilities layout CLO4 Display the procedures required to conduct various concrete tests. CLO5 Display the ability to draw building layout through appropriate technology devices for construction project
Pre-Requisite Courses	No course recommendations

Topics

1. Overview of construction industry
1.1) Introduction to construction industry scenario
1.2) -Category of projects
1.3) -Sectors of the construction industry
1.4) -Stages of a project activity
1.5) -Parties involved and their roles: client, consultant & contractor
1.6) -Contractor structures organization and their roles
1.7) -Contractor scope of works and responsibility
1.8) -Construction team: main contractor, sub contractor, construction manager, contract manager/executive, estimator, site agent, supervisor, foreman
1.9) -Trades: concreter, barbender, carpenter, bricklayer, roofer, plasterer, tiler, joiner, plumber etc.
1.10) -Building element
1.11) -Plants/Machineries/Equipment

2. Site Investigation & Soil Investigation
2.1) Introduction
2.2) -Objective of site investigation
2.3) Types of site investigation: site for new works, defects or failures of existing works, safety of existing work & material for constructional purpose
2.4) -Methods of site investigation: desk study, site reconnaissance, detail examination & special studies and review during construction and monitoring
2.5) -Elements/Factors to be investigated
2.6) -Soil investigation
2.7) -Factors to be considered in planning of soil investigation: type of soil, type of structure, depth of exploration, number of investigation
2.8) -Methods of soil investigation: JKR/Mackintosh probe, trial hole, hand/motorized auger, deep boring,

rotary drilling, deep sounding, plate bearing test, geophysical
2.9) -Analysis of soil investigation result.

3. Site Preparation
3.1) Introduction
3.2) -Site clearing
3.3) -Setting out : boundary, building outline, fixing the corners in place setting up a site datum for vertical level
3.4) -Site layout : importance of site layouts, planning of site layouts

4. Foundation
4.1) Introduction
4.2) Materials
4.3) Concrete mixes and strength
4.4) Types of foundations

5. Reinforced Concrete Framed Structures
5.1) Introduction
5.2) -Materials used to make concrete: cement, sand, aggregate
5.3) -Concrete mixes and strength
5.4) -Reinforcement
5.5) -Formwork
5.6) -RC column construction
5.7) -RC beam construction
5.8) -RC floor Construction

6. Brick and block walls
6.1) Introduction
6.2) -Types of wall
6.3) -Characteristics of wall
6.4) -Bonding
6.5) -Pointing
6.6) -Damp proof course / Damp proof membrane
6.7) -Openings in brick walls
6.8) -Lintels
6.9) -Arches
6.10) -Pier
6.11) -Walls construction

7. Door and Windows
7.1) Introduction
7.2) Types of windows and doors
7.3) Anatomy of windows and doors

8. Materials
8.1) Cement
8.2) Aggregate
8.3) Water
8.4) Admixture
8.5) Concrete
8.6) Mix design

9. Materials laboratory work / workshop
9.1) The objectives of laboratory work are to expose the students to common tests on building materials for use in or off site quality control.
9.2)
9.3) -Grading
9.4) -Methods of sampling and sample reduction of aggregate prior to sieve analysis to determine the size distribution of aggregate
9.5) -
9.6) Tests on Fresh Concrete
9.7) -Methods of mixing and sampling fresh concrete before workability tests; the slump test, the compacting factor test and the vebe consistometer test.
9.8)
9.9) Tests on Hardened Concrete
9.10) -Cube test to determine the compressive strength of concrete
9.11) -Beam test to determine the bending strength or indirect tensile strength of concrete
9.12)
9.13) -Tests on Steel Reinforcement of Concrete
9.14) -To determine tensile strength of reinforcement

10. Technical drafting
10.1) Architectural drawing.
10.2) Plan
10.3) Section
10.4) Elevation
10.5)
10.6) Auto Cad Drawings

Assessment Breakdown	%
Continuous Assessment	40.00%
Final Assessment	60.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Assignment	n/a	10%	CLO2
Final Test	n/a	10%	CLO3
Lab Exercise	Concrete tests -slump test -cube -sieve analysis	10%	CLO4
Lab Exercise	CAD work	10%	CLO5

Reading List

Reference Book Resources

- **Chudley, R & Greeno, R. 2008, *Building Construction Handbook*, 7 Ed., Butterworth Heinemann Publication**
- **Chudley, R & Greeno, R. 2008, *Advanced Construction Technology*, 4 Ed., Pearson Education Limited**
- **Foster J.S 2007, *Structure Fabric 1 & 2*, 7 Ed., Longman**
- **Mohamed A.H 1996, *Penyediaan Tapak dan Struktur Bawah, Dewan*, Dewan Bahasa dan Pustaka**
- **Walton, D. 1995, *Building Construction: Principles and Practices*, Macmillan Education Limited**
- **Tomlinson M.J. 1993, *Pile Design and Construction Practice*, E & FN Spoon**
- **Tong T.B. 1990, *Teknologi Binaan Bangunan*, Dewan Bahasa dan Pustaka**
- **Newman M. 1988, *Construction Details for Concrete Construction*, McGraw-Hill**
- **Shirley, D.E. 1987, *Introduction to Concrete*, Cement and Concrete Assoc**
- **Everett, A. 1986, *Materials*, Batsford**
- **Taylor, G. D. 1985, *Materials in Construction*, Longman London**
- **Fullerton R.L. 1983, *Construction in Warm Climates Vol. 1,2 & 3.*, Oxford University Press**

Article/Paper List: This Course does not have any article/paper resources

Other References: This Course does not have any other resources