UNIVERSITI TEKNOLOGI MARA

BCM444: CONSTRUCTION TECHNOLOGY II

Course Name (English)	CONSTRUCTION TECHNOLOGY II APPROVED
Course Code	BCM444
MQF Credit	4
Course Description	The general aim of the course is to provide sufficient knowledge and understanding of basic principles in building construction and materials. The course covers the element of staircase, roof structures, finishes, timber building, steel building, basement and materials, with emphasis on the technology and installation of the element.
Transferable Skills	Construction Technology skill Teamwork skill Information management skill Communication Skill
Teaching Methodologies	Lectures, Blended Learning, Lab Work, Studio, Presentation
CLO	CLO1 Assess the technology and installation of various building elements and building materials used for construction purpose. CLO2 Display basic masonry and carpentry skills for building construction. CLO3 Demonstrate good presentation skill and team relation in presenting findings and ideas on building elements and materials for construction purpose. CLO4 Demonstrate basic skills in managing group in building construction activity. CLO5 Sketch building layout through appropriate technology devices for building construction.
Pre-Requisite Courses	No course recommendations

Topics
1. Foundation Construction System 1.1) Fundamental of foundation on low rise residential 1.2) Foundation requirement 1.3) Types of foundation 1.4) Foundation construction 1.5) Considerations of Sustainable Foundation System 1.6) Innovative Techniques:
2. Floor Construction System 2.1) Introduction 2.2) Heavy Timber Frame Construction 2.3) Light Timber Frame Construction 2.4) Steel Frame Construction 2.5) Concrete Construction 2.6) Considerations of Sustainable Floor System 2.7) Innovative Techniques
3. Wall Construction System 3.1) Introduction 3.2) Heavy Timber Frame Construction 3.3) Light Timber Frame Construction 3.4) Steel Frame Construction 3.5) Concrete Construction 3.6) Brick Masonry Construction 3.7) Concrete Masonry Construction 3.8) Considerations of Sustainable Wall System 3.9) Innovative Techniques

4. Roof structures and finishes
4.1) Introduction
4.2) Types of roofs
4.3) Heavy Timber Frame Construction
4.4) Light Timber Frame Construction
4.5) Steel Frame Construction
4.6) Concrete Construction
4.7) Considerations of Sustainable Roof System
4.8) Innovative Techniques

5. Opening System
5.1) Introduction
5.2) Types of opening systems
5.3) Opening Construction Method
5.4) Considerations of Sustainable Opening System
5.5) Innovative Techniques

6. Staircase System
6.1) Introduction
6.2) Types of staircase systems
6.3) Staircase Construction Method
6.4) Considerations of Sustainable Staircase Systems
6.5) Innovative Techniques

7. Timber
7.1) Macro and Micro structures of hardwoods and softwoods
7.2) Conversion, seasoning, preservation and grading of timber
7.3) Effect of moisture content on strength and dimensional stability and decay
7.4) Effect of density, grain directions and defect on strength
7.5) Application of timber in construction industry

8. Polymers
8.1) Definition
8.2) Types of Polymers; thermoplastics, thermosetting plastics and elastomers.
8.3) The effect of plasticizers and fillers
8.4) Properties of Polymers; strength, behaviour in fire, thermal conductivity, electrical properties, thermal movement, moisture movement and durability
8.5) Application of polymer products in building industry

9. Bituminous Products
9.1) Types of bituminous products
9.2) Properties of bituminous products
9.3) Application of bituminous products in construction industry

10. Metal
10.1) 1.General properties
10.2) 2.Ferrous Metal
10.3) Comparison of the composition
10.4) Micro-structure and properties of cast iron
10.5) Mild steel, high carbon steel and stainless steel
10.6) Their uses as structural, reinforcing and pre-stressing steels and other uses in building industry
10.7) 3.Non-Ferrous Metal
10.8) Comparison of the composition and manufacture
10.9) Properties and uses of aluminium, copper, zinc and their alloys in building industry

11. Materials Laboratory Work
11.1) The objectives of laboratory work are to expose the students to common tests on building materials for use in or off site quality control.
11.2) -Brick/Blocks
11.3) Brick production and layering
11.4) Test to determine the compressive strength of bricks/blocks
11.5) Wood
11.6) Simple connection system
11.7) Test to determine the bending strength, crushing strength and stiffness of wood

12. Structural drawing & Autocad Drawing
12.1) Plan
12.2) Foundation details
12.3) Beam details
12.4) Column details
12.5) Floor details

Assessment Breakdown	%
Continuous Assessment	40.00%
Final Assessment	60.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Group Project	Students are require to conduct woodwork and brickwork using appropriate tools. Mark will be given on their skills based on completed task.	15%	CLO2
Individual Project	Demonstrate a good relationship among team to complete task.	5%	CLO4
Individual Project	Student required to prepare construction drawings	10%	CLO5
Presentation	Students require to present their finding from site visit. Marks given on students' presentation ability.	10%	CLO3

Reading List

Recommended Text

- **Taylor, G. D. 1985, *Materials in Construction*, Longman, London**

Reference Book Resources

- **1. Chudley, R & Greeno, R, (2008, *Advanced Construction Technology*, 4th Edition Ed., Pearson Education Limited**
- **Chudley, R & Greeno, R, 2008, *Building Construction Handbook*, 7th Edition Ed., Butterworth Heinemann Publication**
- **Foster J.S, 2007, *Structure Fabric 1 & 2*, 7th Edition Ed., Longman**
- **Walton, D. 1995, *Building Construction: Principles and Practices*, Macmillan Education Limited**
- **Kaneta K, 1983, *Steel Construction Guidebook Building Construction*, The Kosai Club.**
- **Fullerton R.L, 1983, *Building Construction in Warm Climates Vol 1,2 & 3*, Building Construction in Warm Climates Vol 1,2 & 3**
- **Hanafi Z, 1996, *Penyediaan Tapak dan Struktur Bawah*, Amber Solara Publication.**
- **Mohamed A.H, 1996, *Penyediaan Tapak dan Struktur Bawah,*, Dewan Bahasa dan Pustaka**
- **Tong T.B, 1990, *Teknologi Binaan Bangunan*, Dewan Bahasa dan Pustaka**
- **Gibbs P, 1987, *Building a Malay House*, Oxford University Press**
- **Everett, A. 1986, *Materials*, Batsford**
- **Kaneta K, 1983, *Steel Construction Guidebook Civil Engineering*, The Kosai Club**
- **Dinwoodies, J.M & Desch, H.E. 1981, *Timber : Its Structure, Properties and Utilisation*, Macmillan Press**
- **Institution of Structural Engineers, 1975, *Design and Construction of Deep Basement, I.S.E.***

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

Other References: This Course does not have any other resources