



UNIVERSITI TUN HUSSEIN ONN MALAYSIA
FAKULTI KEJURUTERAAN AWAM DAN ALAM SEKITAR

PERANCANGAN KULIAH

LECTURE PLAN

MAKLUMAT KURSUS (COURSE INFORMATION)

SEMESTER / SESI (*SEMESTER / SESSION*) : SEMESTER 1 - 2014/2015

KOD KURSUS (*COURSE CODE*) : BFC 32102 / BFC 3142

NAMA KURSUS (*COURSE NAME*) : REINFORCED
CONCRETE DESIGN 1

BEBAN AKADEMIK PELAJAR (*COURSE ACADEMIC LOAD*) :

Aktiviti Pembelajaran (<i>Learning Activity</i>)	Minggu (<i>Week</i>)	Jam / Minggu (<i>Hours / Week</i>)	Bilangan Jam / Semester (<i>Hours / Semester</i>)
Kuliah & Pembelajaran Berpusatkan Pelajar (<i>Lecture & Student Centered Learning</i>)	14	1	14
Tutorial (<i>Tutorial</i>)	14	2	28
Amali (<i>Practical</i>)	-	-	-
Pembelajaran Kendiri dan Penilaian Formal (<i>Independent Study and Formal Assessment</i>)	-	-	20
Lain-lain (<i>Others</i>) 1. Projek (<i>Project</i>) 2. Tugasan (<i>Assignment</i>)	-	-	18
JUMLAH JAM BELAJAR (JJB) <i>TOTAL STUDENT LEARNING TIME (SLT)</i>			80

Kursus Pra-syarat (*Pre requisite Courses*) : STRUCTURAL ANALYSIS (BFC 3023/BFC21403)

Nama Pensyarah (*Lecturer's name*)
1. Dr. Siti Radziah Abdullah (Coordinator. S3 & S4)
2. Dr. Mohd Hilton b. Ahmad (S2 & S6)
3. Pn. Masni Bt A. Majid (S1 & S5)

Disediakan oleh (*Prepared by*) :

Tandatangan (*Signature*) :

Nama (*Name*) : DR. SITI RADZIAH ABDULLAH

Tarikh (*Date*) : 3 SEPTEMBER 2014

Disahkan oleh (*Approved by*) :

Tandatangan (*Signature*) :

Nama (*Name*) : DR. MOHD HAZIMAN WAN
IBRAHIM

Tarikh (*Date*) : 4 3 SEPTEMBER 2014

MATLAMAT (GOALS) :

To provide the knowledge and understanding of reinforced concrete structures design according to the relevant code of practice.

SINOPSIS (SYNOPSIS) :

Reinforced concrete is a composite material made of concrete and steel is widely used to construct the building structures. Plain concrete possesses high compressive strength but little tensile strength. However, steel reinforcement possesses high tensile strength. Therefore, by combining concrete and steel, reinforced concrete attains high utility and versatility. This course introduces students to limit state design for reinforced concrete structures. Scope of study includes introduction to reinforced concrete design, structural analysis, section analysis, serviceability and durability, beam and slab design.

HASIL PEMBELAJARAN (LEARNING OUTCOMES) :

Upon completion of the course, students will be able to:

1. Design reinforced concrete beams and slabs according to BS EN 1992 (EC2).
2. Manipulate structural design processes to complete the assigned project.
3. Report design works which comprise of ideas and problem solving through suitable tools or methods.

ISI KANDUNGAN (CONTENT) :

MINGGU (WEEK)	KANDUNGAN (CONTENT)	PENTAKSIRAN (ASSESSMENT)
1 – 2	<p>1.0 INTRODUCTION TO REINFORCED CONCRETE DESIGN (2 HOURS LECTURE)</p> <p>1.1 Reinforced Concrete 1.2 Structural Design 1.3 Project Procedure 1.4 Reinforced Concrete Structure 1.5 Code of Practice Design Formula 1.6 Design Life 1.7 Limit State Design 1.8 Design Situations 1.9 Actions 1.9.1 Design actions 1.9.2 Combination of action 1.10 Materials Strength 1.10.1 Concrete 1.10.2 Reinforcing steel 1.10.3 Design strength 1.11 Stress-Strain Relationship 1.11.1 Concrete 1.11.2 Reinforcing steel 1.12 Behavior of Beams in Bending 1.13 Basic Assumption in Reinforced Concrete Design 1.14 Distribution of Stresses and Strains 1.15 Types of Structure Failure</p>	Test 1 Final Exam

MINGGU (WEEK)	KANDUNGAN (CONTENT)	PENTAKSIRAN (ASSESSMENT)
2 – 3	<p>2.0 DESIGN FOR FLEXURE (2 HOURS LECTURE)</p> <p>2.1 Introduction</p> <p>2.2 Rectangular Section</p> <p>2.2.1 Singly reinforced section</p> <p>2.2.2 Doubly reinforced section</p> <p>2.2.3 Stress in compression steel</p> <p>2.2.4 Moment redistribution</p> <p>2.2.5 Derivation of equation</p> <p>2.2.6 Design procedure for rectangular section</p> <p>2.3 Flanged Section</p> <p>2.3.1 Analysis of section</p> <p>2.3.2 Design procedure for flanged section</p>	<p>Test 1</p> <p>Quiz 1</p> <p>Final Exam</p>
4 – 5	<p>3.0 DESIGN FOR SHEAR (2 HOURS LECTURE)</p> <p>3.1 Introduction</p> <p>3.2 Shear in Homogeneous Beam</p> <p>3.3 Design Method</p> <p>3.4 The Diagonal Compressive Strut</p> <p>3.5 The Vertical Shear Reinforcement</p> <p>3.6 Additional Longitudinal Force</p> <p>3.7 Shear between the Web and Flanged of a Flanged Section</p> <p>3.8 Design Procedure</p> <p>3.9 Section not Requiring Design Shear Reinforcement</p>	<p>Assignment 1</p> <p>Project</p> <p>Final Exam</p>
6 – 8	<p>4.0 DEFLECTION, CRACKING AND DETAILING (2 HOURS LECTURE)</p> <p>4.1 Introduction</p> <p>4.2 Deflection</p> <p>4.2.1 Limiting span to depth ratio</p> <p>4.3 Cracking</p> <p>4.3.1 Control of cracking without direction calculation</p> <p>4.4 Detailing</p> <p>4.4.1 Spacing of reinforcements</p> <p>4.4.2 Curtailment and anchorage of reinforcement</p> <p>4.4.3 Laps in reinforcements</p>	<p>Test 2</p> <p>Quiz 2</p> <p>Project</p> <p>Final Exam</p>

MINGGU (WEEK)	KANDUNGAN (CONTENT)	PENTAKSIRAN (ASSESSMENT)
9 – 11	<p>5.0 DESIGN OF BEAMS (3 HOURS LECTURE)</p> <ul style="list-style-type: none"> 5.1 Introduction 5.2 Preliminary Size of Beam 5.3 Concrete Cover 5.4 Minimum and Maximum Area of Reinforcement 5.5 Simply Supported Beams 5.6 Continues Beams <ul style="list-style-type: none"> 5.6.1 Load arrangements 5.6.2 Method of Analysis 5.7 Design Procedure <ul style="list-style-type: none"> 5.7.1 Loading Analysis 5.7.2 Design of Flexural Reinforcement 5.7.3 Design for Shear 5.7.4 Deflection 5.7.5 Cracking 5.7.6 Detailing 5.8 Moment Redistribution 	<p>Test 2 Assignment 2 Project Final Exam</p>
12 – 14	<p>6.0 DESIGN OF SLAB (3 HOURS LECTURE)</p> <ul style="list-style-type: none"> 6.1 Introduction 6.2 Design Procedure <ul style="list-style-type: none"> 6.2.1 Loading Analysis 6.2.2 Design of Flexural Reinforcement 6.2.3 Design for Shear 6.2.4 Deflection 6.2.5 Cracking 6.2.6 Detailing 6.3 Design of Solid Slabs <ul style="list-style-type: none"> 6.3.1 One-way Spanning Slab 6.3.2 Two-way Spanning Slab 	<p>Project Final Exam</p>

TUGASAN / PROJEK (ASSIGNMENT / PROJECT) :

Prepare a group report of reinforced concrete beams and slabs design by referring to a building floor plan.

PENILAIAN (ASSESSMENT) :

1. Kuiz (<i>Quiz</i>)	:	5	%
2. Tugas (<i>Assignment</i>)	:	5	%
3. Ujian (<i>Tests</i>)	:	20	%
4. Projek (<i>Project</i>)	:	20	%
5. Lain-lain (<i>Others</i>)	:	-	%
6. Peperiksaan Akhir (<i>Final Examination</i>)	:	50	%
Jumlah (Total)	:	100	%

RUJUKAN (REFERENCES):

1. H. Gulvanessian, J. A. Calgaro and M. Holicky. Designers' guide to EN 1990 : Eurocode : Basis of Structural Design. London : Thomas Telford, 2002. (TA658 .G84 2002).
2. H. Gulvanessian, Paolo Formichi, J.A. Calgaro. Designers guide to Eurocode 1 : Actions on Buildings : EN1991-1-1 and -1-3 to -1-7. London: Thomas Telford, 2009. (TA658.2 .G84 2009).
3. Bill Mosley, John Bungey and Ray Hulse. Reinforced Concrete Design to Eurocode 2. Palgrave Macmillan. 6th edition. 2007. (TA683.2 .M68 2007).
4. Bill Mosley, John Bungey & Ray Hulse. Reinforced Concrete Design to Eurocode 2. Palgrave Mamillan. 6th edition. 2007. (TA683.2 .M68 2007).
5. Prab Bhatt, T.J. MacGinley and Ban Seng Choo; Reinforced Concrete: Design Theory and Examples. Taylor & Francis. 3th , 2005. (TA683.2 .M33 2005).

KEHADIRAN / PERATURAN SEMASA KULIAH (LECTURE ATTENDANCE / REGULATION)

- (1) Pelajar mesti hadir tidak kurang dari 80% masa pertemuan yang ditentukan bagi sesuatu mata pelajaran termasuk mata pelajaran Hadir Wajib (HW) dan mata pelajaran Hadir Sahaja (HS).
Students must attend lectures not less than 80% of the contact hours for every subject including Compulsory Attendance Subjects (Hadir Wajib – HW) and Attendance Only Subjects (Hadir Sahaja – HS).
- (2) Pelajar yang tidak memenuhi perkara (1) di atas tidak dibenarkan menghadiri kuliah dan menduduki sebarang bentuk penilaian selanjutnya. Markah sifar (0) akan diberikan kepada pelajar yang gagal memenuhi perkara (1). Manakala untuk mata pelajaran Hadir Wajib (HW), pelajar yang gagal memenuhi perkara (1) akan diberi Hadir Gagal (HG).
Students who do not fulfill (1) will not be allowed to attend further lectures and sit for any further examination. Zero mark (0) will be given to students who fail to comply with (1). While for Compulsory Attendance Subjects (Hadir Wajib – HW), those who fail to comply with (1) will be given Failure Attendance (Hadir Gagal – HG).

MATRIK HASIL PEMBELAJARAN SUBJEK DAN HASIL PEMBELAJARAN PROGRAM*(SUBJECT LEARNING OUTCOMES AND PROGRAMME LEARNING OUTCOMES MATRIX)*

Dilampirkan (Attached)