

UNIVERSITY OF MAURITIUS
FACULTY OF ENGINEERING
CIVIL ENGINEERING DEPARTMENT
MODULE SPECIFICATION SHEET
Structural Design I

General Information

Level	2	Semester	Yearly
Module Name	Structural Design I	Module code	CIVE 2007Y
Module credits	6.5	Lecture duration	3hrs/week in Room on Level 7 ETB

Aim(s)

To develop an understanding of the basics of reinforced concrete elemental designs, which are in accordance with the recommendations given in BS8110 (Semester I).

Syllabus outline

Introduction to structural design, estimation of loads on different structural elements, design of reinforced concrete, steel, timber and precast beams. Assignment.

Design of reinforced concrete, steel and timber columns, design of concrete and steel portal frames, design of connections for timber and steel beams and columns. Design project.

Lecture Schedule (Semester I)

1	Introduction	2	Loads and limit states
3	Beam design I (singly reinforced)	4	Beam design II (Doubly reinforced)
5	Slab design I (One-way spanning)	6	Slab design II (Two-way spanning slab)
7	Column design I (Axially loaded)	8	Column design II (slender columns)
9	Foundation design I (Pad footing)	10	Foundation design II (Combined footing)
11	Staircase design I	12-15	Mini Project & Detailing

Assignments (Semester I)

Both individual and group assignments will be entertained.

Assignment #	Type of Assignment (G: group and I: Individual)	Assignment description	Due before or during lecture #	Marks/assignment
1	G	Compile a report on locally available materials, their characteristics and current price. G1: Blocks; G2: Steel; G3: Concrete aggregates; G4: Concrete; and G5: Admixtures	3 A five minute presentation summarizing your findings will be compulsory.	25 marks for report 10 marks for supporting documents (price, specifications, etc...) 5 marks for presentation
2	G	A rectangular one-storey structure has internal dimensions (4m by 5.5m). The 150mm thick slab supports a 300l water tank, and is supported on 300mm deep by 200mm wide perimeter beams. Determine the SLS and ULS load on each column.	4 A five minute presentation summarizing your calculations will be compulsory.	10 marks for assumptions made. 15 marks for calculations. 5 marks for presentation.
3	I	For structure described in assignment 2, design and detail the most critical beam to BS8110.	5	10 marks for methodology 10 marks for assumptions 10 marks for detailing (free hand sketches or cad dwg)
4	I	For structure described in assignment 2, design and detail the RC slab to BS8110.	7	10 marks for methodology 10 marks for assumptions 10 marks for detailing (free hand sketches or cad dwg)
5	I	For structure described in assignment 2, design and detail the most critical column to BS8110.	9	10 marks for methodology 10 marks for assumptions 10 marks for detailing (free hand sketches or cad dwg)
6	I	For structure described in assignment 2, design and detail the most critical base to BS8110.	11	10 marks for methodology 10 marks for assumptions 10 marks for detailing (free hand sketches or cad dwg)
7	I	Design and detail a one flight RC staircase to access the roof slab of the structure described in assignment 2.	12	10 marks for methodology 10 marks for assumptions 10 marks for detailing (free hand sketches or cad dwg)

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Mini-Project

Lectures 12 to 15 will be dedicated to in-class group mini-project where each group will have to plan, design and detail (free hand sketches) a small reinforced concrete residential building that satisfies the following requirements.

The proposed structure should be a one-storey high building for a family of 4 people. The floor area should not exceed 1000 square feet. It is imperative that you make provision for a staircase within the structure to access the roof.

All calculations and detailing will be done in class. You will have to bring your own slide rule, calculators, engineering paper and other amenities that you think will help you in the mini-project.

Marking of Mini-project

Lecture	Deliverables	Due at the end of lecture or before	Marks
12	Planning of house Free hand sketch of house – ground floor layout	12	25
13	Design and detailing of slab	13	50
14	Design and detailing of beams and columns	14	50
15	Design and detailing of foundation and staircase	15	50

Learning Outcomes

Having studied this module, students should be able to:

- Design and detail reinforced concrete, steel and timber structural elements and
- Perform the necessary checks for each of the elemental design.

Lecturer's details & Consultation time

Name Mr.A.SEEBOO **Phone** 454-1041 (ext 1737)
E-mail a.seeboo@uom.ac.mu **Availability** ETB Level 7 Room 8 (Monday 13:00pm to 14:00pm or on appointment)

Course work (Total marks to be reduced to 30%)

Class tests are scheduled at the start of lectures 7 and week 11. It will last for 45 minutes and will carry 100 marks.

Examination (Total marks will be reduced to 70%)

Examination will consist of four compulsory questions. British Standards will not be allowed.

Group works, inclusive of mini-project, will be carried out in groups of 5.

<i>Group 1</i>	<i>Group 2</i>	<i>Group 3</i>	<i>Group 4</i>	<i>Group 5</i>

NB:

Late submission of any assignment will result in penalty point at the rate of 5marks per day.

Recommended book

W.H.Mosley, J.H.Bungey & R.Hulse (1999). Reinforced concrete Design. Mac.Millan Press Ltd.U.K.