The Hong Kong University of Science and Technology

UG Course Syllabus

[Course Title] **Reinforced Concrete Design**

[Course Code] **CIVL 3320**

[No. of Credits] **3**

[Prerequisites] **CIVL 2810 AND CIVL 3310**

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Course Description

This is a required course for civil engineering students and a necessary background for any structural engineer. It follows a chain of structural engineering courses which include CIVL 2110 (Statics), CIVL 2120 (Mechanics of Materials) and CIVL 3310 (Structural Analysis).

The purpose of the course is to introduce the fundamental and indispensable for structural engineers, basic design principles. Specifically, the course introduces the principles and methods of design for reinforced concrete structures. The focus is on the limit states design approach that is at the core of most contemporary design codes. Subsequently, the course discusses how to design reinforced concrete members namely: slabs, beams, columns, and (depending on the available time) potentially staircases, and beam-column joints, for the most common ultimate, as well as, serviceability limit states (of deflection and cracking). The course materials are written to conform to the Hong Kong Code of Practice for Structural Use of Concrete 2013, while BS 8110 and EC2 are also referred when appropriate.

Course outline

The course comprises of the following chapters-modules:

1. Design of Reinforced Concrete
2. Analysis of Sections of Reinforced Concrete Members
3. Shear, Bond and Torsion
4. Serviceability
5. Design of Reinforced Concrete Beams
6. Design of Reinforced Concrete Slabs
7. Design of Reinforced Concrete Columns

Assessments:

Assessment serves two purposes: to help the student achieve the learning outcomes and to produce evidence of that learning.

Assessment Task	Contribution to Overall Course grade (%)
Participation	5%
Assignments & Labs	20%
Midterm	30%
Final Exam	45%

- Assignments and lab reports are generally due one week after they are assigned.
- Failing the final exam may incur a failing grade of the course.

Required Texts and Materials

- Kuang JS. Design of Reinforced Concrete, CIVL 3320 Course Notes. HKUST.

- Design to BS 8110:
  Mosley WH, Bungey JH, Hulse R (1999). Reinforced Concrete Design, 5th edn. Palgrave MacMillan, Hampshire.
  Bhatt P, MacGinley TJ, Choo BS (2006). Reinforced Concrete: Design Theory and Examples, 3rd edn. Taylor & Francis, Abingdon, Oxfordshire.

- Design to Eurocode 2:
  Mosley WH, Bungey JH, Hulse R (2012). Reinforced Concrete Design to Eurocode 2, 7th edn. Palgrave MacMillian, Hampshire.
  Bhatt P, MacGinley TJ, Choo BS (2014). Reinforced Concrete: Design Theory and Examples, 4th edn. CRC Press, Boca Raton, Florida.

Codes of practice

- Buildings Department (2013). Code of Practice for Structural Use of Concrete 2013. The Government of Hong Kong SAR, Hong Kong. (This design code can be downloaded from "http://www.bd.gov.hk/english/documents/index_crlist.html") British Standards Institution (1997). Structural Use of Concrete, BS 8110. BSI, London.

- British Standards Institution (2004). BS EN Eurocode 2:2004 Design of Concrete Structures – Part 1-1: General Rules and Rules for Buildings. BSI, London.