Description: Concrete Structures

Subject Cat-Nbr Class Term Mode Units Campus
CIV 3506 10594 1, 2002 ONC 1.00 TWMBA

Academic Group: FOENS
Academic Org: FOES03
HECS Band: 2
ASCED Code: 030903

STAFFING
Examiner: Graham Baker
Moderator: Amar Khennane

PRE-REQUISITES
Pre-requisite: CIV 2503 and CIV 3505

SYNOPSIS
Concrete is a versatile building material which is used extensively in multistorey buildings, airports, dams, roads and many other important parts of today's modern infrastructure. Whilst it is inherently strong in compression, its weakness in tension is offset by suitable steel reinforcement which is initially either unstressed or prestressed. This results in a composite material which requires a detailed understanding of its behaviour before safe and economical designs can be produced. Accordingly this course provides a detailed coverage of: The Behaviour of Reinforced and Prestressed Concrete, Durability and Fire Resistance, Behaviour and Design for Strength and Serviceability of Reinforced Concrete Beams, Slabs and Columns, Anchorage, Detailing, Behaviour and Design for Strength and Serviceability of Fully Prestressed and Partially Prestressed Concrete Beams and Slabs.

OBJECTIVES
Upon successful completion of this course, the student should be able to:

• Calculate the design loads on an element for both the strength and serviceability limit states.
• Explain the background to, and be able to apply, the durability and fire resistance provisions of AS3600 Concrete Structures.
• Describe the behaviour under load of reinforced concrete beams and select a beam size and reinforcement layout which satisfies the strength and serviceability limit state requirements of AS3600.
• Describe the behaviour under load of slender reinforced concrete columns and select a column size and reinforcement layout which satisfies the strength limit state requirements of AS3600.
• Describe the behaviour under load of reinforced concrete slabs and select a slab size and reinforcement layout which satisfies the strength and serviceability limit state requirements of AS3600.
• Draw layouts and details of the reinforcement designed in 3, 4 and 5 above.
• Describe the behaviour under load of statically determinate prestressed concrete beams and slabs and select a beam or slab size and reinforcement and tendon layout which satisfies the strength and serviceability limit states of AS3600.

TOPICS

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General principles of reinforced concrete</td>
<td>10.00</td>
</tr>
<tr>
<td>2. Load estimation for RC structures</td>
<td>5.00</td>
</tr>
<tr>
<td>3. Durability and fire resistance</td>
<td>2.00</td>
</tr>
<tr>
<td>4. The behaviour, analysis and design of RC beams</td>
<td>20.00</td>
</tr>
<tr>
<td>5. The behaviour, analysis and design of RC slabs</td>
<td>18.00</td>
</tr>
<tr>
<td>6. The behaviour, analysis and design of RC columns</td>
<td>15.00</td>
</tr>
<tr>
<td>7. Detailing of reinforced concrete members</td>
<td>15.00</td>
</tr>
<tr>
<td>8. The behaviour, analysis and design of prestressed beams</td>
<td>15.00</td>
</tr>
</tbody>
</table>

TEXT and MATERIALS required to be PURCHASED or ACCESSED:

Books can be ordered by fax or telephone. For costs and further details use the 'Book Search' facility at http://bookshop.usq.edu.au by entering the author or title of the text.

CIV3506 Concrete Structures, Study Book, USQ Publication.

A hand held battery operated calculator which does not have keys for the alphabet.

HB2.2 Australian Standards for Civil Engineering Students, Structural Engineering, Standards Australia, Current Edition.

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY | HOURS
---|---
Assessment | 10
Examinations | 3
Lectures | 26
Private Study | 90
Tutorial | 26

ASSESSMENT DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks Out of</th>
<th>Wtg(%)</th>
<th>Required</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSIGNMENT 1</td>
<td>100.00</td>
<td>10.00</td>
<td>Y</td>
<td>04 Mar 2002</td>
</tr>
<tr>
<td>(see note 1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASSIGNMENT 2</td>
<td>100.00</td>
<td>10.00</td>
<td>Y</td>
<td>04 Mar 2002</td>
</tr>
<tr>
<td>(see note 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 HOUR RESTRICTED EXAMINATION</td>
<td>800.00</td>
<td>80.00</td>
<td>Y</td>
<td>END S1</td>
</tr>
<tr>
<td>(see note 3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
1. Further details about the due dates are detailed in the assessment section of the Course Specifications.
2. Further details about the due dates are detailed in the assessment section of the Course Specifications.
3. Further details about the due dates are detailed in the assessment section of the Course Specifications.

OTHER REQUIREMENTS

1. To pass this course students must achieve all of the following: (a) A sound level of competency in each assessment in the course. This is normally indicated by achieving not less than 50% of the maximum possible marks in each assessment. (b) A sound level of competency in the whole course. This is normally indicated by accumulating not less than 500 marks in total.
2. A minimum standard of communication skills must be demonstrated in order for a passing grade to be achieved.
3. The due date for an assignment is the date by which a student must submit the assignment to the USQ. The onus is on the student to provide proof of the submit date, if requested by the Examiner.
4. Students must retain a copy of each item submitted for assessment. This must be produced within five days if required by the Examiner.
5. In accordance with University's Assignment Extension Policy (Regulation 5.6.1), the examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances.
6 If students submit assignments after the due date without prior approval then a penalty of up to 20% of the total marks for the assignment will apply for each working day late.

7 In the event that a due date for an assignment falls on a local public holiday in their area, such as a Show holiday, the due date for the assignment will be the next day. Students are to note on the assignment cover the date of the public holiday for the Examiner's convenience.

8 The Faculty of Engineering and Surveying will NOT accept submission of handwritten or typed assignments by facsimile, e-mail or computer diskette. Students in remote locations who do not have regular access to postal services may be given special consideration.

9 The final grades for students will be assigned on the basis of the aggregate of the marks obtained for each of the assessments in the course.

10 A Restricted Examination indicates that students will be allowed access to specific materials during the examination. The only materials that candidates may use in the restricted examination for this course are non-programmable calculators.

11 The Faculty of Engineering and Surveying does not offer supplementary examinations.

12 Students who have undertaken all of the required assessments in a course but who have failed to meet some of the specified objectives of a course within the normally prescribed time may be awarded the temporary grade: IM (Incomplete - Make up). An IM grade will only be awarded when, in the opinion of the examiner, a student will be able to achieve the remaining objectives of the course after a period of non-directed personal study.

13 Students who, for medical, family/personal, or employment-related reasons, are unable to complete an assignment or to sit for an examination at the scheduled time may apply to defer an assessment in a course. Such a request must be accompanied by appropriate supporting documentation. One of the following temporary grades may be awarded IDS (Incomplete - Deferred Examination; IDM (Incomplete Deferred Make-up; IDSM (Incomplete Deferred Examination and Make-up).