## Subject Description Form

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>BRE302</th>
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</thead>
<tbody>
<tr>
<td>Subject Title</td>
<td>Structure II</td>
</tr>
<tr>
<td>Credit Value</td>
<td>3</td>
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<tr>
<td>Level</td>
<td>3</td>
</tr>
<tr>
<td>Pre-requisite / Co-requisite / Exclusion</td>
<td>AMA290 &amp; BRE204, or their equivalents</td>
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### Objectives
Consolidate the knowledge gained in Structure I and to extend this knowledge to include structural principles as related to design/construction of structural elements in building works. At the end of this subject, the student is expected to be able to design building structural elements and appreciate the design of temporary steelworks.

### Intended Learning Outcomes
Upon completion of the subject, students will be able to:

- Appreciate the structural design principles in limit state design and their applications to the design of permanent building structures according to the “Code of Practice for the Structural Use of Steel 2005” and the “Code of Practice for Structural Use of Concrete 2004 (Second Edition)”, published by the Buildings Department of Hong Kong SAR.

- Design and analyze the basic types of steel structural members and connections.

- Design and analyze the basic types of Reinforced Concrete (RC) members.

- Appreciate the design of temporary steelworks/RC Works in building construction, tower crane erection in particular.

- Improve on problem-solving skills, communication skills in written format, teamwork spirit in professional context.

### Subject Synopsis / Indicative Syllabus

**Design Concept**
Limit states design: ultimate limit states and serviceability limit states, load combination.

*Structural principles applied to the use of structural steel design*
Structural steel design to the *Code of Practice for the Structural Use of Steel 2005*. Tension members, beams (laterally restrained and unrestrained), columns, beam-columns, welded and bolted connections.

*Structural principles applied to the use of reinforced concrete design*
Reinforced concrete design to the *Code of Practice for Structural Use of Concrete 2004*: singly and doubly reinforced concrete beams, shear reinforcement, simply supported slabs, one-way continuous slab, compression members under axial load and moment, average and local bond stresses.

*Temporary works engineering*
Basic principles, Codes, Standards and Regulations related to the design and erection of temporary steelworks.
Teaching/Learning Methodology

Interactive lectures will enable students to understand the basic design concepts and learn how to design basic structural members with due consideration to their service conditions;

Tutorial will enable students to consolidate the structural design concept through design problem-solving assignments and discussions;

Laboratory works will enable students to identify, through a loading test, the structural behavior of a full-scale simply supported steel beam subjected to bending;

Demonstrations at the Industrial Center will enable students to appreciate the quality control and nondestructive tests on the structural steel welding.

Assessment Methods in Alignment with Intended Learning Outcomes

<table>
<thead>
<tr>
<th>Specific assessment methods/tasks</th>
<th>% weighting</th>
<th>Intended subject learning outcomes to be assessed (Please tick as appropriate)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>a</td>
</tr>
<tr>
<td>1. Assignments</td>
<td>35</td>
<td>✓</td>
</tr>
<tr>
<td>2. Mid-term Exam</td>
<td>15</td>
<td>✓</td>
</tr>
<tr>
<td>3. Final exam</td>
<td>50</td>
<td>✓</td>
</tr>
<tr>
<td>Total</td>
<td>100 %</td>
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Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The students will be assessed through their independently completed assignments, which contribute to 35%, a fair percent for exercise/learning/assessment; mid-term and final exams will contribute to 65%, which is used to assess the learning results of individual student; the lab report will be prepared and assessed in small groups, which is counted as a part of the assignments.

Student Study Effort Expected

Class contact:

- LEC 21 Hrs.
- TUT/LAB 21 Hrs.

Other student study effort:

- SELF-STUDY/ASSIGN 120 Hrs.
- Hrs.

Total student study effort 162 Hrs.

Reading List and References

Recommended:


Supplementary:

Structural Use of Concrete - BS 8110: Part 1, 1997, British Standards Institution.

Code of Practice for the Structural Use of Steel, Buildings Department, Government of HKSAR, 2005.


Construction Sites (Safety) Regulation, Cap. 59, HKSAR.

Factories and Industrial Undertaking Ordinance, Section 6A & 6B – General Duties, HKSAR.

Factories and Industrial Undertaking (lifting Appliance and lifting Gear) Regulation, HKSAR.

Code of Practice for Safe Use of Mobile Cranes & Tower Cranes, Labour Dept., HKSAR.

Code of Practice for Safe Use of Cranes BS7121: Parts 1 & 2, British Standards Institution.