Subject Description Form

Subject Code	BRE302
Subject Title	Structure II
Credit Value	3
Level	3
Pre-requisite	AMA290 & BRE204, or their equivalents
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 students are expected to be able to appreciate the design concepts of steel and reinforced concrete structures and design basic building structural elements.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) 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" and the "Code of Practice for Structural Use of Concrete 2004", published by the Buildings Department of Hong Kong SAR. b) Design and analyze the basic types of steel structural members and connections. c) Design and analyze the basic types of Reinforced Concrete (RC) members. d) 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.
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

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<tr><td></td><td>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;</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td></td><td></td></tr>
<tr><td>1. Assignments</td><td>35</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>2. Mid-term Exam</td><td>15</td><td>✓</td><td>✓</td><td></td><td></td><td></td><td></td></tr>
<tr><td>3. Final exam</td><td>50</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="6"></td></tr>
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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 contributes 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.</td></tr>
<tr><td>Student Study Effort Expected</td><td>
<table>
<tr><td>Class contact:</td><td></td></tr>
<tr><td>▪ LEC</td><td>26 Hrs.</td></tr>
<tr><td>▪ TUT/LAB</td><td>13 Hrs.</td></tr>
<tr><td>Other student study effort:</td><td></td></tr>
<tr><td>▪ SELF-STUDY/ASSIGN</td><td>120 Hrs.</td></tr>
<tr><td>▪</td><td>Hrs.</td></tr>
<tr><td>Total student study effort</td><td>159 Hrs.</td></tr>
</table>
</td></tr>
<tr><td>Reading List and References</td><td>Recommended:

MacGinley, T.J. and Choo, B.S. (1990). Reinforced concrete: design theory and examples, E & FN Spon, London. Available in NetLibrary through PolyU Library.

Moseley W.H., Bungey J.H., Hulse R. (1997). Reinforced Concrete Design, 5th Edition, Macmillan.

MacGinley, T.J. and Ang, T.C. (2004). Structural Steelwork: design to limit state theory, 3rd Edition, Elsevier Butterworth-Heinemann, Jordan Hill, Oxford.

Nethercot, D.A. (2001). Limit states design of structural steelwork, 3rd edition, Spon Press. Available in NetLibrary through PolyU Library.

Currie B., Sharp R.A. (1990). Structural Design, Stanley Thornes, Surrey, UK.</td></tr>
</table>

	Supplementary: *Steelwork Design Guide to BS 5950: Parts 1 and 2*. The Steel Construction Institute and The British Constructional Steelwork Association Limited, UK. *Code of Practice for the Structural Use of Steel*, Buildings Department, Government of HKSAR, 2011. *Structural Use of Concrete - BS 8110: Part 1*, 1997, British Standards Institution. *Code of Practice for Structural Use of Concrete*, Buildings Department, Government of HKSAR, 2013. *Construction Sites (Safety) Regulation, Cap. 59*, HKSAR. Code of Practice for Dead and Imposed Loads, Buildings Department, Government of HKSAR, 2011.