**University/Academy**: Benha

**Faculty/Institute:** Engineering

**Department:** Civil Engineering

**Form no. (12)**

**Course Specification**

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| **1- Course Data** | | | |
| **Course Code:**  C 1371 | **Course Title:**  Design of Steel Structures(1-a) | | **Academic Year/Level:**  3rd year Civil |
| **Specialization:**  Civil Engineering | **No. of Instructional Units:**  5 | **Lecture** 3 **Practical** 2 | |

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| **2- Course Aim** | 1- Understanding of steel material as one of the construction materials  2- Understanding of design steel elements having different types of internal forces  3- Understanding of design the steel connection using bolts or welding |
| **3- Intended Learning Outcome** | |
| **a- Knowledge and Understanding** | a.1 Understand steel sections and its properties.  a.2 Understand the design of tension and compression members  a.3 Understand the design and analysis of steel columns  a.4 Understand the design of steel compact and non-compact beams  a.5 Understand the effect of lateral tensional buckling on the allowable stresses  a.6 Understand the design of steel bolted connections  a.7 Understand the design of steel welded connections |

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| **b- Intellectual Skills** | b.1 Define the needed steel structure problems.  b.2 Derive different safe solution alternatives for the steel structure engineering problems.  b.3 Analyze the solution alternatives and choose the optimum one for steel structure systems. |
| **c- Professional Skills** | c.1 Implement quality control procedures during construction of steel structure elements.  c.2 Supervise steel structure construction work.  c.3 Produce and read steel structure engineering drawings. |
| **d- General Skills** | d.1 Present and share ideas.  d.2 Work in a team, and communicate with others. |

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| **4- Course Content** | Steel as a construction material - Material properties and steel sections - Steel design codes and the Allowable Stress Design method (ASD) - Design of tension members. Design of axially loaded compression members - Behavior of short columns - Behavior of slender columns - Elastic and inelastic buckling - Design of columns - Effective length concept - Columns in braced and unbraced frames - Design of flexure members - Types and classification of beam cross sections - Bending strength of compact and non-compact cross sections - Design of laterally supported beams - Lateral-torsional buckling - Design of laterally unsupported beams - Design of beam-columns (combined axial and flexural forces) - Design of bolted connections - Bearing type and friction type bolted connections - Design of welded connections. |
| **5- Teaching and Learning Methods** | 1- Case studies.  2- Discussion sessions.  3- Lectures. |
| **6- Teaching and Learning Methods for Students with Special Needs** | 1- Case studies.  2- Discussion sessions.  3- Lectures. |
| **7- Student Assessment:** | 1. Written examinations at the mid and end of the term to assess understanding and scientific knowledge.  2. Assignments and quizzes to assess ability to solve problems and analyze results. |
| **a- Procedures used:** | 1. Assignments.  2. Quizzes.  3. Mid term exam.  4. Final exam. |

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| **b- Schedule:** | Assignment 1 Week 4  Quiz 1 Week 5  Assignment 2 Week 7  Mid-term exam Week 8  Assignment 3 Week 10  Quiz 2 Week 12  Assignment 4 Week 13  Assignment 5 Week 14  Quiz 3 Week 14 |
| **c- Weighing of Assessment:** | Mid-term examination 20 %  Final-term examination 60 %  Quiz 10 %  Assignments 10 %  Total 100 % |
| **8- List of Textbooks and References:** | 1- Egyptian code for design of steel structure  2- Steel structures design by Prof Dr. Abdelrahim Khalil Dessouki |
| **a- Course Notes** | - Staff lectures notes |
| **b- Required Books (Textbooks)** | 1- steel design hand book by. Prof Dr. Bahaa M. Mashaly Part 1  1- steel design hand book by. Prof Dr. Bahaa M. Mashaly Part 2  1- steel design hand book by. Prof Dr. Bahaa M. Mashaly Part 3 |
| **c- Recommended Books** | Steel structures design by Prof Dr. Abdelrahim Khalil Dessouki |
| **d- Periodicals, Web Sites, ..., etc.** |  |

**Course Instructor:** Assist. Prof. Dr. Nader Nabih Khalil  **Head of Department:** Assoc. Prof. Dr. Khaled M. El Sayed

**Date:** 25/3/2013