**University/Academy**: Benha

**Faculty/Institute:** Engineering

**Department:** Civil Engineering

**Form no. (12)**

**Course Specification**

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| **1- Course Data** | | | |
| **Course Code:**  C 1572 | **Course Title:**  Advanced Steel Structures (3,2,\*)  Elective course(list A) | | **Academic Year/Level:**  4th year Civil |
| **Specialization:**  Civil Engineering | **No. of Instructional Units:**  6 | **Lecture** 4 **Practical** 2 | |

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| **2- Course Aim** | 1- Understanding the design of cold formed sections  2- Understanding the stabilit and plastic analysis of steel frames  3- Understanding the design and erection of special types of steel bridges |
| **3- Intended Learning Outcome** | |
| **a- Knowledge and Understanding** | a.1 Understand the design of cold formed sections.  a.2 Understand the stability and plastic analysis of steel frames.  a.3 Understand the direct analysis method.  a.4 Understand the design of steel joists.  a.5 Understand the design of special types of steel bridges.  a.6 Understand the erection method of steel bridges. |

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| **b- Intellectual Skills** | b.1 Define the needed steel bridges problems.  b.2 Define the needed cold formed sections problems.  b.3 Derive different safe solution alternatives for the steel bridges engineering problems.  b.4 Analyze the solution alternatives and choose the optimum one for steel frames using stability and plasticity analysis. |
| **c- Professional Skills** | c.1 Implement quality control procedures during construction of steel frames and bridges structure elements.  c.2 Supervise steel bridges structure construction work.  c.3 Produce and read steel structures and bridge 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** | Design of cold formed sections - Plastic analysis and design (Plastic hinge concept - Determination of collapse mechanism - Plastic analysis and design of rigid frames) - Frame stability and second order effects - Direct analysis method - Design of open web steel joists and steel deck - Topics relevant to bridge design (Beam grids - Curved and skew bridges - Composite bridges - Temperature effect in bridges - Erection of bridges). |
| **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