1. **Basic Information:**

|  |  |
| --- | --- |
| **Program Title** | Civil Engineering |
| **Department Offering the Program** | Civil Engineering Department |
| **Department Responsible for the Course** | Basic Science and Engineering |
| **Course Title** | Strength of Materials |
| **Course Code** | ENG 205 |
| **Year/Level** | 2nd level – first term |
| **Specialization** | Major |
| **Authorization Date of Course Specification** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Teaching hours** | **Lectures** | **Tutorial** | **Practical** |
| 2 | 2 | - |

1. **Course Aims:**

|  |  |
| --- | --- |
| **No.** | **Aims** |
| 01 | Apply knowledge of mathematics, science, engineering concepts to understand the mechanical properties of the different elements to analyze the different stresses acting on. |

1. **Learning Outcomes (ILO’S):**
2. **Knowledge and understanding:**

|  |  |
| --- | --- |
| **No.** | **Knowledge and understanding** |
| A1 | Define the concepts and theories of mathematics, science necessary for engineering system analysis, general concepts of strenghth of material, normal stress, direct shear stress, mohr`s cycle. |

1. **Intellectual Skills:**

|  |  |
| --- | --- |
| **No.** | **Intellectual Skills** |
| B2 | Think creatively to select the appropriate solutions for engineering problems and system design, normal stress, direct shear, stresses in beams, torsional stresses |

1. **Professional Skills:**

|  |  |
| --- | --- |
| **No.** | **Professional Skills** |
| C2 | Apply engineering knowledge and understanding to improve design, products and/or services, normal stress, direct shear stress, stresses in beams, torsional stresses, pressure vessels ,mohr`s cycle. |
| C4 | Practice the neatness and aesthetics in design to approach stresses in beams, torsional stresses, pressuere vessels. |

1. **General Skills:**

|  |  |
| --- | --- |
| **No.** | **General Skills** |
| D6 | Effectively manage tasks, time, and resources. |

**4. Course Contents:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Topics** | **Lectures** | **Tutorial** | **Practical** |
| **1** | **Simple states of stress and strain** | **2** | **2** |  |
| **2** | **Tension and comprssion stress** | **4** | **4** |  |
| **3** | **Shear sress in bolts** | **4** | **4** |  |
| **4** | **Bending and shearing stresses in beams** | **6** | **6** |  |
| **5** | **Torsion stresses** | **4** | **4** |  |
| **6** | **Analysis of thin-walled pressure vessels** | **4** | **4** |  |
| **7** | **Analysis of plane stress** | **4** | **4** |  |
| **Total** | | **28** | **28** |  |

**5. Teaching and learning methods:**

|  |  |
| --- | --- |
| **No.** | **Teaching Methods** |
| 1 | Lectures |
| 2 | Discussion sessions |
| 3 | Information collection from different sources |
| 4 | Research assignment |
| 5 | Case studies |

**6. Teaching and learning methods for disable students:**

|  |  |  |
| --- | --- | --- |
| **No** | **Teaching Methods** | **Reason** |
| 1 | Presentation of the course in digital material | Better access any time |
| 2 | Asking small groups to do assignments; each composed of low, medium, and high performance students. | Knowledge and skills transfer among different level of students. |

7**. Student evaluation:**

**7.1 Student evaluation method**:

|  |  |  |
| --- | --- | --- |
| **No.** | **Evaluation Method** | **ILO’s** |
| 1 | Mid Term examination | A1, B2 |
| 2 | Semester work | C4, C2, D6 |
| 3 | Final term examination | A1, B2, C2,C4,D6 |

**7.2 Evaluation Schedule:**

|  |  |  |
| --- | --- | --- |
| **No.** | **Evaluation Method** | **Weeks** |
| 1 | semester work | , , |
| 2 | Mid Term examination |  |
| 3 | Final term examination |  |

**7.3 weighting of Evaluation:**

|  |  |  |
| --- | --- | --- |
| **No.** | **evaluation method** | **Weights** |
| 1 | Mid-term examination | 20% |
| 2 | Semester work | 20% |
| 3 | Final-term examination | 60% |
| TOTAL | | 100% |

**8. List of References:**

|  |  |
| --- | --- |
| **No.** | **Reference list** |
| **1** | Hibbeler, R. C. "Statics and Mechanics of Materials 2nd." *New Jersey: Pentice Hall* (2004). |
| **2** | Gupta, J. K., and R. S. Khurmi. "A Textbook of Machine Design." *SI Edition* (2005). |
| **3** | Menard, Kevin P. *Dynamic mechanical analysis: a practical introduction*. CRC press, 2008. |

**9. Facilities required for teaching and learning:**

|  |  |
| --- | --- |
| **No.** | **Facility** |
| 1 | Lecture classroom |
| 2 | seminar |
| 3 | White board |
| 4 | Data Show system |

**10. Matrix of knowledge and skills of the course:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Topic** | **Aims** | **Knowledge and understanding** | **Intellectual Skills** | **Professional Skills** | **General Skills** |
| **1** | **Simple states of stress and strain** | **1** | **A1** | **B2** | **C2** | **D6** |
| **2** | **Tension and comprssion stress** | **1** | **A1** | **B2** | **C2,C4** | **D6** |
| **3** | **Shear sress in bolts** | **1** | **A1** | **B2** | **C2,C4** | **D6** |
| **4** | **Bending and shearing stresses in beams** | **1** | **A1** | **B2** | **C2,C4** | **D6** |
| **5** | **Torsion stresses** | **1** | **A1** | **B2** | **C2,C4** | **D6** |
| **6** | **Analysis of thin-walled pressure vessels** | **1** | **A1** | **B2** | **C2,C4** | **D6** |
| **7** | **Analysis of plane stress** | **1** | **A1** | **B2** | **C2** | **D6** |

**Course Coordinator:** Dr. A. E. Kabeel

**Head of Department:** prof.Dr. Mohamed Saad Elkady

**Date of Approval:**  jan.2017