King Fahd University of Petroleum & Minerals

**DEPARTMENT OF CIVIL & Environmental ENGINEERING**

**CE 202 – STATICS AND STRENGTH OF MATERIALS**

**Second Semester 2013-14 (132)**

 **Time: 11:00-11:50; Bldg.: 04; Room: 149**

**Instructor**: Dr. Saeid A. Alghamdi; **Office**: 16-150; **Phone**: 9-2570

**e-mail**: saghamdi@kfupm.edu.sa

**Webpage**: <http://faculty.kfupm.edu.sa/CE/saghamdi/index.htm>

**Textbook:** **Statics and Mechanics of Materials; 3rd ed.; by: R.C. Hibbeler**

**Course Outline; Schedule 132 & Assigned HW-Problems**

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| **Lec.** | **Day** | **Date** | **Topic** | **Chapters & Sections** | **HW-Problems** |
| 1 | **U** | Jan. 26. | Introduction: Scalars and Vectors | 1; 2.1-2.3 | **1:** 1-16; 2-3; 2-7; 2-23; 2-26; 2-38 |
| 2 | **T** | 28 | Scalars & vectors, Addition of Coplanar forces | 2.4 | - |
| 3 | **R** | 30 | Addition of Coplanar Forces | 2.4 Applications |  |
| 4 | **U** | Feb. 02 | Moment of a Force (scalar and vector methods) | 3.1-3.3 | **2:** F3-7; 3-15; 3-25; 3-31; 3-59; 3-78 |
| 5 | **T** | 4 | Force and Couple system | 3.6 | **Submit HW-1** |
| 6 | **R** | 6 | Force and Couple system (cont'd.) | 3.7 |  |
| 7 | **U** | 9 | Equilibrium of a particle | 4.1 & 4.2 | **3:** 4-2; 4-10; 4-14; 4-21; 4-59; 4-71 |
| 8 | **T** | 11 | Equilibrium of a rigid body | 4.3; 4.4 | **Submit HW-2** |
| 9 | **R** | 13 | Equilib. of a rigid body (cont'd.) & Dry Friction | 4.7 & 4.8  |  |
| 10 | **U** | 16 | Simple Trusses; The method of Joints | 5.1 | **4:** 5-7; 5-11; 5-16; 5-58; 5-75 |
| 11 | **T** | 18 | Simple Trusses; The method of Joints (contd.) | 5.2 ; 5.3 | **Submit HW-3** |
| 12 | **R** | 20 | Frames and Machines | 5.5 |  |
| 13 | **U** | 23 | Frames and Machines (cont'd.) | 5.5 contd. | **5:** 6-9; 6-21; F6-16; 6-33 |
| 14 | **T** | 25 | Center of Gravity (C.G.) and Centroid | 6.1; 6.2 | **Submit HW-4** |
| 15 | **R** | 27 | C.G. and Centroid (cont'd.) & Resultant of loading | 6.3 |  |
| 16 | **U** | March 02 | Moment of Inertia for composite areas | 6.4; 6.5 | **6:** 6-45; 6-57; F6-26; 6-68 |
| 17 | **T** | 4 | Moment of Inertia for composite areas (cont'd.) | 6.6 | **Submit HW-5** |
| - | **W** | **5** | **First Major Examination (March 05, 2014)** |  **All sections covered in Chapters 1-5** |
| 18 | **R** | 6 | Internal Forces | 7.1; 7.2 |  |
| 19 | **U** | 9 | Internal Forces (contd.) | 11.1; 11.2 | **7:** 7-1; 7-3; 7-14; 7-15; 11-11 |
| 20 | **T** | 11 | Shear and Moment equations and Diagrams | 11.2 contd. | **Submit HW-6** |
| 21 | **R** | 13 | Shear and Moment equations and Diagrams (cont'd.) | handouts |  |
| 22 | **U** | 16 | Shear and Moment equations and Diagrams (cont'd.) | Application | **8:** 11-18; 7-21; 7-26; 7-41; 7-42; 7-50 |
| 23 | **T** | 18 | Average Normal Stress In axially loaded bar | 7.3; 7.4 | **Submit HW-7** |
| 24 | **R** | 20 | Average Shear stress | 7.5 |  |
| **-** | **-** |  | **Mid-term Break (March 23-27, 2014)** | **-** |  |
| **Cont'd … (1/2)** |
|  |  |  |  |  |
| **Lec.** | **Day** | **Date** | **Topic** | **Chapters & Sections** | **HW-Problems** |
| 25 | **U** | 30 | Bearing stress; Factor of safety | 7.6; 7.7 | **9:** 7-43; 7-82; 7-94; 7-102 |
| 26 | **T** | April 01 | Bearing stress; Factor of safety (cont'd.) | 7.8; 7.9 | **Submit HW-8** |
| 27 | **R** | 3 | Strain | 8.1; 8.2 |  |
| 28 | **U** | 6 | Stress and Strain diagrams | 8.3; 8.4 | **10:** 8-4; 8-15; 8-25; 8-27 |
| 29 | **T** | 8 | Materials Behavior | 8.6; 8.7 | **Submit HW-9** |
| 30 | **R** | 10 | Axial loads member & Axial elastic deformations  | 9.1; 9.2 |  |
| 31 | **U** | 13 | Elastic Deform. Of Axially loaded Member (cont'd.) | 9.4 | **11:** 9-4; 9-10; 9-19; 9-30; 9-40 |
| 32 | **T** | 15 | Torsion of Shafts , Torsion Formula | 10.1 | **Submit HW-10** |
| **-** | **W** | **16** | **Second Major Examination (April 16, 2014)** |  **Sections covered in Chapters 6; 7; 8 & 11** |
| 33 | **R** | 17 | Torsion of Shafts, Torsion Formula (cont'd.) | 10.2 |  |
| 34 | **U** | 20 | Torsion of Shafts, Power Transmission | 10.3 | **12:** 10-5;; 10-18; 10-43; 10-47; 10-53 |
| 35 | **T** | 22 | Torsion of Shafts, Power Transmission (cont'd.) | 10.4 | **Submit HW-11** |
| 36 | **R** | 24 | Torsion of shafts, Angle of Twist (cont'd.) | 10.4 contd. |  |
| 37 | **U** | 27 | Torsion of shafts, Angle of Twist (cont'd.) | 10.5 | **13:** 11-40; 11-42; 11-62; 11-66 |
| 38 | **T** | 29 | Bending; The Flexure formula | 11.3 | **Submit HW-12** |
| 39 | **R** | May 01 | Bending; The Flexure formula (cont'd.) | 11.3 contd. |  |
| 40 | **U** | 4 | The Shear Formula | 12.1;12.2 | **14:** 12-11; 12-21; 12-23 |
| 41 | **T** | 6 | The Shear Formula (cont'd.) | 12.2 contd. | **Submit HW-13** |
| 42 | **R** | 8 | Compound (combined) Loadings | 13.1 |  |
| 43 | **U** | 11 | Compound Loadings (cont'd.) | 13.2 | **15:** 13-4; 13-6; F13-5; 13-29; 14-14; 14-39 |
| 44 | **T** | 13 | Stress Transformations  | 14.1; 4.2 | **Submit HW-14** |
| 45 | **R** | 15 | Principal Stresses using Mohr's Circle | 14.3; 14.4 |  |

**Remarks:**

* **Attendance:** i) continuous attendance is essential for each student to smoothly follow the development of course-material; ii) each missed class without an proper-excuse will induce 0.5 point score-deduction of the final score; iii) University regulations regarding excessive absences will be strictly adhered to in this course **(9 un-excused absences – DN grade**).
* **Homework-Assignments**: i) HW-assignments are essential to practice and master the course material; ii) The assigned problems are to be submitted weekly; ii) Each home work MUST be submitted (on-time as scheduled) according to the Standard Format with a cover page.
* **Quizzes:** There will be announced short (in-class) quizzes lasting for about 15 to 20 minutes. The quizzes are also of pivotal importance and require careful preparation.
* **Homework-Assignments**: i) HW-assignments are essential to practice and master the course material; ii) The assigned problems are to be submitted weekly; iii) Each home work MUST be submitted (on-time as scheduled) according to the Standard Format with a cover page; iv) Students are encouraged to discuss the assigned problems to explore the best way to solve a particular problem, but the submitted works for each student are expected to reflect his independent understanding and presentation; and v) The last HW (No. 15) assigned will be collected from students for evaluation one day before the final examination.

**Course Grading Policy:**

* **Class works** ( Attendance; Participation; HWs; Quizzes)**:** 15 %
* **Two Major Exams:** **Exam I** (**Wed.; March 05**) & **Exam II** (**April 16, 2014**) 50 %
* **Final Examination:**(To be scheduled) 35 %

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