**Form No: ÜY-FR-0261**

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|  | **ECTS Course Description Form** |
| **PART I ( Senate Approval)** |
| **Offering School**  | College of Engineering |
| **Offering Department** | Civil Engineering |
| **Program(s) Offered to** | Civil Engineering | Must |
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|  |  |
| **Course Code**  | CE242 |
| **Course Name** | Strength of Materials I |
| **Language of Instruction** | English |
| **Type of Course** | Lecture |
| **Level of Course** | Undergraduate |
| **Hours per Week** | **Lecture:** 3 | **Laboratory: 0** | **Recitation:** 0 | **Practical: 0** | **Studio:** 0 | **Other:** 0 |
| **ECTS Credit** | 5 |
| **Grading Mode** | Letter Grade |
| **Pre-requisites** | **CE 241** |
| **Co-requisites** | **-** |
| **Registration Restriction** | - |
| **Educational Objective** | 1. To provide students with a clear and thorough presentation of the theory and and the application of principles of strength of materials.
2. To give the concepts of stress and strain, normal stress and strain, shear stress and strain, general state of stress, and design of simple connections

**3.** To give an ability to calculate stresses and deformations of objects under external loadings.**4.** To give an ability to apply the knowledge of strength of materials on engineering applications and design problems.   |
| **Course Description** | The course covers stress and strain concepts, mechanical properties of materials, axial load, torsion, bending, transverse shear, combined loadings, stress and strain transformations, design and deflection of beams and shafts, buckling of columns and energy methods.  |
| **Learning Outcomes**  | **LO1** | Checking general definitions about the course and recognize the material properties.Determining internal stresses; Normal, Shear and moment diagrams.Checking yielding behavior on the material.Under loading, checking material behavior within the context of strain relations.Analyzing nominal stresses, Drawing Mohr circle.Checking torsion behavior of the material |
| **LO2** |
| **LO3** |
| **LO4** |
| **LO5** |
| **LO6** |
| **n..** |
| **PART II ( Faculty Board Approval)** |
| **Basic Outcomes (University-wide)** | **No.** | **Program Outcomes** | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **LO6** |
| **PO1** | **Ability** to communicate effectively and write and present a report in Turkish and English.  | LO1, LO2, LO3, LO4, LO5, LO6LO1, LO2, LO3, LO4, LO5, LO6LO1, LO2, LO3, LO4, LO5, LO6LO1, LO2, LO3, LO4, LO5, LO6LO1, LO2, LO3, LO4, LO5, LO6LO1, LO2, LO3, LO4, LO5, LO6LO1, LO2, LO3, LO4, LO5, LO6LO2, LO3, LO4, LO5, LO6LO2, LO3, LO4, LO5, LO6LO3, LO4, LO5, LO6 |
| **PO2** | **Ability** to work individually, and in intra-disciplinary and multi-disciplinary teams. |
| **PO3** | **Recognition** of the need for life-long learning and **ability** to access information , follow developments in science and technology, and continually reinvent oneself. |
| **PO4** | **Knowledge** of project management, risk management, innovation and change management, entrepreneurship, and sustainable development. |
| **PO5** | **Awareness** of sectors and **ability** to prepare a business plan. |
| **PO6** | **Understanding** of professional and ethical responsibility and **demonstrating** ethical behavior. |
| **Faculty Specific Outcomes** | **PO7** | Ability to develop, select and use modern techniques and tools necessary for engineering applications and ability to use information technologies effectively. |
| **PO8** | Recognition of the effects of engineering applications on health, environment and safety in the universal and societal dimensions and the problems of the time and awareness of the legal consequences of engineering solutions. |
| **Discipline Specific Outcomes (program)** | **PO9** | Sufficient knowledge in mathematics, science and civil engineering; and the ability to apply theoretical and practical knowledge in these areas to model and solve engineering problems. |
| **PO10** | Ability to design a complex system, process, device or product to meet specific requirements under realistic constraints and conditions of economic, environmental, sustainability, manufacturability, ethics, health, safety, social and political issues; and the ability to apply modern design methods for this purpose. |
| **Specialization Specific Outcomes** | **PO N….** |  |
| **PART III ( Department Board Approval)** |
| **Course Subjects, Contribution of Course Subjects to Learning Outcomes, and Methods for Assessing Learning of Course Subjects** | **Subjects** | **Week** |  | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **LO6** |
| **S1** | 1 | Introduction | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 |
| **S2** | 2-3 | Stress | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 |
| **S3** | 4 | Strain and mechanical properties of the material | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 |
| **S4** | 5-6 | Axial Loading | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 |
| **S5** | 7-8 | Thermal stresses and torsion | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 |
| **S6** | 9 | Bending | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 |
| **S7** | 10 | Shear force and moment diagrams | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 |
| **S8** | 11 | Transverse shear stress | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 |
| **S9** | 12 | Shear yielding | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 |
| **S10** | 13 | Thin walled pressure vessels | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 |
| **S11** | 14 | Plane Stress Transformations, Nominal Stresses, Mohr Circle | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 | A1-A2 |
| **Assessment Methods, Weight in Course Grade, Implementation and Make-Up Rules**  | **No.** | **Type** | **Weight** | **Implementation Rule** | **Make-Up Rule** |
| **A1** | **Exam** | 80% | In the exam none of electronical equipment are allowed except than calculators. | If the special case of the student is justified or if the report is accepted by the school, he is informed about the time of the make up exam. |
| **A2** | **Quiz** | 10% | The time and subject matter will be informed to the students at least one week in advance. | There is no makeup exam for quizzes. |
| **A3** | **Homework** | 10% | All the announcements, including the homework submission deadline will be posted on the course web site |  |
| **A4** | **Project** |  |  |  |
| **A5** | **Report** |  | - | - |
| **A6** | **Presentation** |  | - | - |
| **A7** | **Attendance/ Interaction** |  | Students are expected to regularly attend class. When absent, they are responsible for notes, homework assignment, quiz and exams. Valid excuses are exempt from computation of attendance percentages.  | - |
| **A8** | **Class/Lab./****Field Work** |  | - | - |
| **A9** | **Other** |  |  |  |
| **TOTAL** | **100%** |
| **Evidence of Achievement of Learning Outcomes** | Students will demonstrate learning outcomes through midterm exams, quiz work and preparation and the final exam. Every topic is tested with at least one exam question. In order to pass, a student needs to accumulate certain percentage of points and this percentage is determined by the class mean. |
| **Method for Determining Letter Grade** | The method on which the letter grade is based on will be announced at the beginning of the semester, and this method may be subjected to change depending on the performance of the students.Two midterms, quiz questions, a final exam are used for grading. The table shows the maximum points to be collected.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Assessment** | Midterm  | Homework | Quiz | Final exam | TOTAL |
| **Points** | 40 | 10 | 10 | 40 | 100 |

Letter grade is determined using the table below:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Total points** | 100-95 | 94-85 | 84-80 | 79-75 | 74-65 | 64-60 | 59-55 | 54-50 | 49-45 | 44-40 |
| **Letter Grade** | A | A- | B+ | B | B- | C+ | C | C- | D+ | D |

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| **Teaching Methods, Student Work Load** | **No** | **Method** | **Explanation** | **Hours** |
| **Time applied by instructor** |
| **1** | **Lecture** |  | 56 |
| **2** | **Interactive Lecture** |  | - |
| **3** | **Recitation** |  | - |
| **4** | **Laboratory** |  | - |
| **5** | **Practical** |  | - |
| **6** | **Field Work** |  | - |
| **Time expected to be allocated by student** |
| **7** | **Project** |  | - |
| **8** | **Homework** |  | - |
| **9** | **Pre-class Learning of Course Material**  |  | 36 |
| **10** | **Review of Course Material** |  | 30 |
| **11** | **Studio** |  | - |
| **12** | **Office Hour** |  | 28 |
| **TOTAL** | 150 |
| **IV. PART** |
| **Instructor** | **Name** | Niyazi Ugur Kockal |
| **E-mail** | ugur.kockal@antalya.edu.tr |
| **Phone Number** | 90 (242) 245 00 45 |
| **Office Number** | A1-68 |
| **Office Hours** | Will be specified in semester |
| **Course Materials** | **Mandatory** | - |
| **Recommended** | Text Book is “Mechanics of Materials, 8th Edition R.C. Hibbeler, Pearson, ISBN 10:0-13-602230-8; ISBN 13: 978-0-13-602230-5 |
| **Other** | **Scholastic Honesty** | Violation of academic honesty; Not to cheat or attempt to make copies, to plagiarize, to not reveal false information or quote, to facilitate dishonest acts by others, to obtain exams without permission, to use an earlier study without giving information to the instructor, or to change the academic work of other students etc. Any violation of academic honesty is a serious academic offense and will be the consequence of the university's disciplinary rules. |
| **Students with Disabilities** | The course provides appropriate conditions for students with disabilities regarding the assessment of the process and learning. |
| **Safety Issues**  | The handling of the course does not require any special safety precautions. |
| **Flexibility** | In case of compulsory during the semester the course can be changed by informing the students by way of instruction. |