|  |
| --- |
| **COURSE DESCRIPTION** |
| **Course code and title** | **FIZ3134 THERMODYNAMICS** |
| **Course Semester** | 6 |
| **Course Content** | Introduction and Basic Concepts, Energy Conversion and General Energy Analysis, Properties of Pure Substances, Energy Analysis of Closed Systems, Mass and Energy Analysis of Control Volumes, The Second Law of Thermodynamics, Entropy, Exergy: A Measure of Work Potential |
| **Recommended or Required Reading** | Thermodynamics: an engineering approach, Yunus A. Çengel ve Michael Boles, McGRAW-Hill. New York. |
| **Recommended or Required Reading** | **1.** StephenBlundell&KatherineBlundell, “Concepts of ThermalPhysics”, Oxford Scientific, 2006 **2.**The Laws of Thermodynamic, P.W. Akkins, Published 2010, Oxford University Press, USA. |
| **Credits of Course (ECTS)** | 3 |
| **Prerequisites** | There is no prerequisite for this course. There is a compulsory course attendance. |
| **Type of Course** | Elective |
| **Language of Instruction** | Turkish |
| **Purpose and Object of the Course** | The objective of the course is to teach the principles of thermodynamics that are effective in development and understanding of the processes at micro and macro scales. |
| **Learning Outcomes Of The Course Unit** | 1. Students understand the basic definitions of Thermodynamics2. Learn fundamental concepts such as closed, open and isolated thermodynamic systems, thermodynamic equilibrium and extensive and intensive properties3. Become knowledgeable about heat and work interactions4. Become knowledgeable about properties of pure substances, phase diagrams and phase transitions5. Become knowledgeable about the first and second law of thermodynamics and their applications to closed and open systems6. Describes the chemical reactions in accordance with the principles of conservation of energy and mass |
| **Planned Learning Activities and Teaching Methods** | The mode of delivery of this course is face to face |
| **Course Per Week** | Week 1: Introduction and Basic ConceptsWeek 2: Energy Conversion and General Energy AnalysisWeek 3: Properties of Pure SubstancesWeek 4: Properties of Pure SubstancesWeek 5: Energy Analysis of Closed SystemsWeek 6: Energy Analysis of Closed SystemsWeek 7: Mass and Energy Analysis of Control VolumesWeek 8: Mass and Energy Analysis of Control VolumesWeek 9: Midterm exam, The Second Law of ThermodynamicsWeek 10: The Second Law of ThermodynamicsWeek 11: EntropyWeek 12: EntropyWeek 13: Exergy: A Measure of Work PotentialWeek 14: Exergy: A Measure of Work PotentialWeek 15: Final exam |
| **Workload** | Theoretical Study Hours of Course Per Week: 3hoursPracticing Hours of Course Per Week:0Reading:3 hoursSearching in Internet and Library:2Designing and Applying Materials:2Preparing Reports: 4Preparing Presentation:4Presentation:4Mid-Term and Studying for Mid-Term: 6 hoursFinal and Studying for Final: 10 hours |
| **Assessment Methods And Criteria** |  | **Number** | **Total contribution****(%)** |  |
| Mid-terms | 1 | 40 |
|  Assignment | 1 | 20 |
| Exercise | - | - |
| Projects | - | - |
| Practice |  |  |
| Quiz | - | - |
| Contribution of In-term Studies to Overall Grade (%) | - | 60 |
| Contribution of Final Examination to Overall Grade (%) | - | 40 |
|  Attendance | - | - |
| **Efficiency** | **Activities** | **Total number of weeks** | **Time****(Weekly)** | **Total efficiency at the end of the semester** |
| Theoretical Study Hours of Course Per Week | 14 | 3 | 42 |
| Practicing Hours of Course Per Week | 14 | 0 | 0 |
| Reading | 2 | 3 | 6 |
| Searching in Internet and Library | 2 | 2 | 4 |
| Designing and Materials, Applying | 2 | 2 | 6 |
| Preparing Reports | 1 | 4 | 4 |
| Preparing Presentation | 1 | 4 | 4 |
| Presentation | 1 | 4 | 4 |
| Mid-Term and Studying for Mid-Term | 1 | 1 | 6 |
| Final and Studying for Final | 1 | 10 | 10 |
| Other | - | - | - |
| TOTAL WORKLOAD | - | - | 86 |
| TOTAL WORKLOAD/ 25 |  |  | 3,44 |
| ECTS of Course |  |  | 3 |
| **Course's Contribution To Program** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | PROGRAM LEARNING OUTCOMES | 1 | 2 | 3 | 4 | 5 |
| 1 | Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems. |  |  |  | X |  |
| 2 | Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose. |  |  |  |  | X |
| 3 | Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose. |  |  | X |  |  |
| 4 | Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively. |  |  |  | X |  |

 |
| **Name of Lecturer(s) and** **E-mail(s) of Lecturer(s)** | Prof. Dr. Şule UĞUR, (suleugur@gazi.edu.tr) |