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| **Subject** | **THERMODYNAMICS** |
| Type | Semester | ECTS | Code |
| Elective (E) | 3 | 4 |  |
| **Course lecturer** | Dr.sc .Sami Gashi |
| **Course assistant** |  |
| **Subject tutor** |  |
| **Aims and Objectives** | The course of Thermodynamics covers the basics of general thermodynamic principles and their application in engineering. The goal is for students to master the knowledge of basic thermodynamic principles and their application in engineering, which will be helpful in their further studies as well as in their work. |
| **Expected results** | After passing the exam, students are expected to:* specify and define the units of measurements of basic thermodynamic magnitudes and the state equation
* specify and correctly interpret the basic laws of thermodynamics
* specify and explain thermodynamic changes of the state of ideal gases
* define and explain the processes of expansion and compression
* define and explain cycles processes
* specify and describe heat properties and changes of the state of real gases
* discern and analyse processes in devices used to obtain low temperatures
* define thermodynamic properties of moist air and processes with moist air
* know how to distinguish and analyze the processes of heat transfer with conduction and convection
* know how to identify and analyze heat exchangers
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| **Table of Contents** | **Weekly plan** | **Week** |
| General concepts. Heat and energy parameters in thermodynamic processes. | 1 |
| Basic laws of thermodynamics. The first law of thermodynamics using internal energy and enthalpy. | 2 |
| Thermodynamic changes of the state of ideal gases (isobaric, isochoric, isothermal, adiabatic and polytrophic changes of state). | 3 |
| The second law of thermodynamics, reversibility, irreversibility, thermal diagram and changes of the state in thermal diagrams. | 4 |
| Cycles processes. Carnot and thermal efficiency degree. | 5 |
| Compression and expansion processes. | 6 |
| First test | 7 |
| Real gases: liquid state, evaporation, wet and dry saturated steam, superheated steam, fundamental processes. | 8 |
| Thermal properties and changes of the state of real gases. Thermodynamics diagrams and tables for variables of state | 9 |
| Water vapour – thermodynamic parameters of the state. | 10 |
| Vapour power cycles; Moist air; Processes with moist air | 11 |
| Thermodynamic fundamentals of the cooling process. Vapor-compression refrigeration. Coefficient of performance | 12 |
| Heat Transfer, Conduction and Heat Transfer (Convection); Heat exchangers | 13 |
| Second Test | 14 |
| Final Exam | 15 |
| **Literature / References** | M. J. Moran, H. N. Shapiro, D. B. Daisie, M. B. Bailey, Fundamentals of Engineering Thermodynamics, 7th Ed., Wiley, New York, 2010.N. Petric, I. Vojnović, V. Martinac, Tehničkatermodinamika, 2 izdanje, on line (2007-01-09), Kemijsko-tehnološkifakultet, Split, 2007.V. Martinac, Termodinamika i termotehnika (priručnik – formule i tablice), on line (2008-12-09), Kemijsko-tehnološkifakultet, Split, 2008.Literatura jo detyrueshme:Y. A. Cengel, M. A. Boles, Thermodynamics: An Engineering Approach, 7th Ed., McGraw-Hill, New York, 2011.R. E. Sonntag, C. Borgnakke, G. J. Van Wylen, Fundamentals of thermodynamics, 8th Ed., Wiley, New York, 2012. |
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