**ESOGU MECHANICAL ENGINEERING DEPARTMENT**

**COURSE INFORMATION FORM**

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| **Course Name** | **Course Code** |
| Air Conditioning System | 151818424 |

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| **Semester** | **Number of Course Hours per Week** | | **ECTS** |
| **Theory** | **Practice** |
| 8 | 3 | 0 | 5 |

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| **Course Category (Credit)** | | | | |
| **Basic Sciences** | **Engineering Sciences** | **Design** | **General Education** | **Social** |
|  |  | X |  |  |

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| **Course Language** | **Course Level** | **Course Type** |
| Turkish | Undergraduate | Elective |

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| **Prerequisite(s) if any** |  |
| **Objectives of the Course** | The aim of the course is to provide the student with the ability to design various air conditioning and ventilation systems |
| **Short Course Content** | Introduction to air conditioning, general definitions, basic principles, mass transfer, psychrometric and applications, cooling load account, air duct design and design. |

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| **Learning Outcomes of the Course** | | **Contributed PO(s)** | **Teaching Methods \*** | **Measuring Methods \*\*** |
| **1** | To understand the basic elements and comfort conditions of air conditioning | 1,2,6,7 | 1,5 | K |
| **2** | To be able to calculate the thermodynamic properties of moist air | 1,2,6 | 1,5,10 | D,E,K |
| **3** | Use of psychrometric diagram and demonstration of operations performed in the diagram | 1,2,6 | 1,5,10 | D,E,K |
| **4** | Calculation of heat gain and cooling load | 1,2,3,6,7 | 1,8,10,11,15 | E,G,J,K |
| **5** |  |  |  |  |
| **6** |  |  |  |  |
| **7** |  |  |  |  |
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| **Main Textbook** | Yamankaradeniz, R., Horuz, İ., Coşkun, S., Kaynaklı, Ö., Yamankaradeniz, N., (2012) “İklimlendirme Esasları”, Dora yayıncılık |
| **Supporting References** | - Porge, F., (2001) “HVAC Engineer's Handbook”, Elsevier Science & Technology Books  - Kreider, J.F., (2001) “Handbook of Heating, Ventilation, and Air Conditioning” CRC Press. |
| **Necessary Course Material** | Computer, projector. |

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| **Course Schedule** | |
| **1** | Introduction to air conditioning |
| **2** | Basic principles of air conditioning |
| **3** | Central air conditioning systems, air conditioning units |
| **4** | Classification and selection of air conditioning systems |
| **5** | Mass Transfer |
| **6** | Psychrometric diagrams and applications |
| **7** | Processes performed in pschrometric diagram |
| **8** | Mid-Term Exam |
| **9** | Processes performed in pschrometric diagram |
| **10** | Air conditioning systems applications |
| **11** | Calculation of cooling load |
| **12** | Calculation of cooling load |
| **13** | Air conditioning units and elements |
| **14** | Water cooling towers |
| **15** | Types of water cooling towers |
| **16,17** | Final Exam |

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| **Calculation of Course Workload** | | | |
| **Activities** | **Number** | **Time (Hour)** | **Total Workload (Hour)** |
| Course Time (number of course hours per week) | 14 | 3 | 42 |
| Classroom Studying Time (review, reinforcing, prestudy,….) | 14 | 1 | 14 |
| Homework | 1 | 20 | 20 |
| Quiz Exam |  |  |  |
| Studying for Quiz Exam |  |  |  |
| Oral exam |  |  |  |
| Studying for Oral Exam |  |  |  |
| Report (Preparation and presentation time included) | 2 | 20 | 40 |
| Project (Preparation and presentation time included) | 1 | 22 | 22 |
| Presentation (Preparation time included) |  |  |  |
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| Mid-Term Exam |  |  |  |
| Studying for Mid-Term Exam |  |  |  |
| Final Exam |  |  |  |
| Studying for Final Exam |  |  |  |
|  | **Total workload** | | **138** |
|  | **Total workload / 30** | | **4.6** |
|  | **Course ECTS Credit** | | **5** |

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| **Evaluation** | |
| **Activity Type** | **%** |
| Mid-term |  |
| Quiz |  |
| Homework | 50 |
| Bir öğe seçin. |  |
| Project Observation | 50 |
| **Final Exam** |  |
| **Total** | 100 |

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| **RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO)** (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low) | | |
| **NO** | **PROGRAM OUTCOME** | **Contribution** |
| **1** | Sufficient knowledge of engineering subjects related with mathematics, science and mechanical engineering; an ability to apply theoretical and practical knowledge on solving and modeling of mechanical engineering problems. | 4 |
| **2** | Ability to determine, define, formulate and solve complex mechanical engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods. | 3 |
| **3** | Ability to design a complex system, a component and/or an engineering process under real life constrains or conditions, defined by environmental, economical and political problems; for that purpose an ability to apply modern design methods. | 4 |
| **4** | Ability to develop, select and use modern methods and tools required for mechanical engineering applications; ability to effective use of information technologies. | 2 |
| **5** | In order to investigate mechanical engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results. | 1 |
| **6** | Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence. | 3 |
| **7** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | 3 |
| **8** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | 1 |
| **9** | Understanding of professional and ethical issues and taking responsibility. | 1 |
| **10** | Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development. | 1 |
| **11** | Knowledge of actual problems and effects of engineering applications on health, environment and security in global and social scale; an awareness of juridical results of engineering solutions. | 2 |
| **12** |  |  |

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| **LECTUTER(S)** | | | | |
| **Prepared by** | Associate Professor Özge ALTUN |  |  |  |
| **Signature(s)** |  |  |  |  |

**Date:**06.06.2024