



ESOGÜ Electrical-Electronics Engineering Department

COURSE CODE: 151227642-151247642 **COURSE TITLE:** Intro. to Mechatronics

| Semester | Weekly Hours | | COURSE | | | |
|--|--------------|--|---------------|--------------------------|-------------------------------|------------------------------|
| | Theoretical | Practical | Credits | ECTS | Type | Language |
| VII | 3 | 2 | 4 | 7 | Compulsory () Elective (x) | Turkish () English (x) |
| Write the credit (for non-credit courses weekly hours) below (If necessary distribute the credits.). | | | | | | |
| Math and Basic Science | | Electrical Engineering [mark (√) if there is high design content] | | General Education | | Humanities |
| | | () | | | | |
| Assessment | | THEORETICAL-PRACTICAL COURSES | | | LABORATORY COURSES | |
| | | Type | Number | % | Activity Type | Number % |
| Midterm | | Midterm | 1 | 40 | Quiz | |
| | | Quiz | | | Lab performance | |
| | | Homework | | | Report | |
| | | Project | 1 | 20 | Oral exam | |
| | | Other (.....) | | | Other (.....) | |
| Final | | | 1 | 40 | | |
| Makeup exam (Oral/Written) | | | | | | |
| Prerequisites | | Circuit Analysis, Electronic Circuits, Logic Circuits | | | | |
| Brief content of the course | | Studying basics of the mechatronic and measurement systems. Studying theory and applications of the commonly used sensors and actuating instruments | | | | |
| Objectives of the course | | Having a theoretical and practical background on mechatronic systems which the industry needs commonly today. | | | | |
| Contribution of the course towards professional education | | This course will support and contribute to many electrical and electronics courses by giving mechanical, programming, and measurement aspects. It will do same effect to the mechanical engineering student courses. | | | | |
| Outcomes of the course | | Familiarity to the mechatronic systems in the Industry. Predevelopment of some problem solving abilities on the subject. | | | | |
| Textbook of the course | | Introduction to Mechatronics and Measurement Systems, David G. Alciatore, Michael B. Hstand | | | | |
| Other reference books | | Books on measurement, measurement devices, electrical machineries, sensors, electronic and mechanical elements, PIC mikrocontrollers. User guides and data sheets also help. | | | | |
| Required material for the course | | Measurement tools, some electronic circuit elements, sensors, motors, and PIC programmers. Computer Lab. support. also needed. | | | | |

| WEEKLY PLAN OF THE COURSE | |
|---------------------------|---|
| Week | Topics |
| 1 | Introducing mechatronic and measurement system terminology |
| 2 | Basic electrical relations, circuit elements, and circuit analysis |
| 3 | Semiconductor electronics |
| 4 | Approaches to analyzing and characterizing the response of mechatronic and meas. systems |
| 5 | Basics of analog signal processing and the design and analysis of operational amplifiers. |
| 6 | Basics of digital devices and the use of integrated circuits. |
| 7 | Microcontrollers and PIC microcontroller family |
| 8 | Midterm |
| 9 | Midterm |
| 10 | Data acquisition and how to couple computers to the measurement systems |
| 11 | Common sensors in mechatronic systems |
| 12 | Common devices used for actuating mechatronic systems |
| 13 | Introduction to control theory and its role in mechatronic system design |
| 14 | Overview of mechatronic system control architectures and some case studies |
| 15,16 | Final |

| NO | OUTCOMES OF THE PROGRAMME | 4 | 3 | 2 | 1 |
|----|--|---|---|---|---|
| 1 | Adequate knowledge of mathematics, science and Electrical and Electronic Engineering; ability to practice theoretical and practical knowledge of these areas into modeling and solving complex problems of Electrical and Electronic Engineering | | | | |
| 2 | Ability to identify complex engineering problems in Electrical and Electronic Engineering and related fields, for this purpose having skills to formulate, select and apply appropriate methods. | | | | |
| 3 | Having skills to apply modern design methods to design a complex system, process, equipment or product that should work under realistic conditions and constraints and satisfy specific requirements concerning the Electrical and Electronic Engineering. | | | | |
| 4 | Having skills to develop, select and apply modern techniques and tools needed to analyze and solve complex applications in Electrical and Electronic Engineering, skills to use information technology effectively. | | | | |
| 5 | Skills to design and conduct tests, collect data, analyze results, and interpret data for the experimental investigation of complex problems in Electrical and Electronic Engineering | X | | | |
| 6 | Ability to function effectively as an individual and as a member of teams within the discipline and in multidiscipline areas. | X | | | |
| 7 | Communicating effectively in oral and written form both in Turkish and English. Effective report writing and understanding written reports, preparing design and manufacturing reports, making effective presentations, skills to give and receive clear and concise instructions. | | | | |
| 8 | Awareness of the necessity of lifelong learning, access to information, monitoring developments in science and technology and the ability to self-renewing | | | | |
| 9 | Understanding of professional and ethical responsibility | | | | |
| 10 | Information on project management, change management and risk management practices, awareness on entrepreneurship and innovation, knowledge on sustainable development. | | X | | |
| 11 | Information about universal and societal effects of engineering applications on health, safety and environment; awareness of the legal consequences of engineering solutions. | | | | |

Scale for assessing the contribution of the course to the program outcomes:

4: High 3: Medium 2: Low 1:None

Name of Instructor(s):

Signature(s):

Date: