



ESOGÜ Electrical-Electronics Engineering Department

COURSE CODE: 151228541

COURSE TITLE: INTRODUCTION TO MECHATRONICS

| Semester | Weekly Hours | | COURSE | | | | |
|--|--------------|---|---------------|---------------------------|--|---------------|----------|
| | Theoretical | Practical | Credits | ECTS | Type | | |
| VIII | 3 | 0 | 3 | 5 | Compulsory () Elective (x) Technical elective I group | | |
| 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 | 30 | Quiz | | |
| | | Quiz | | | Lab performance | | |
| | | Homework | | | Report | | |
| | | Project | 1 | 30 | Oral exam | | |
| | | Other (.....) | | | Other (.....) | | |
| Final | | | 1 | 40 | | | |
| Makeup exam (Oral/Written) | | | | | | | |
| Prerequisites | | | | | | | |
| Brief content of the course | | <i>Studying basics of the mechatronic and measurement systems. Studying theory and applications of the commonly used sensors and actuating instruments</i> | | | | | |
| Objectives of the course | | <i>Having a theoretical and practical background on mechatronic systems which the industry needs commonly today.</i> | | | | | |
| Contribution of the course towards professional education | | <i>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.</i> | | | | | |
| Outcomes of the course | | <i>Familiarity to the mechatronic sytems in the Industry. Predevelopment of some problem solving abilities on the subject.</i> | | | | | |
| Textbook of the course | | <i>Introduction to Mechatronics and Measurement Systems, David G. Alciatore, Michael B. Hstand</i> | | | | | |
| Other reference books | | <i>Books on measurement, measurement devices, electrical machineries, sensors, electronic and mechanical elements, PIC mikrocontrollers. User guides and data sheets also help.</i> | | | | | |
| Required material for the course | | <i>Measurement tools, some electronic circuit elements, sensors, motors, and PIC programmers. Computer Lab. Support also needed.</i> | | | | | |

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

| NO | OUTCOMES OF THE PROGRAMME | 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 problems of Electrical and Electronic Engineering | | X | |
| 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. | | X | |
| 3 | Having skills to apply modern design methods to design a complex system, equipment or product that should work under realistic conditions and constraints and satisfy specific requirements concerning the Electrical and Electronic Engineering. | | X | |
| 4 | Having skills to develop, select and apply modern techniques and tools needed for Electrical and Electronic Engineering applications, skills to use information technology effectively. | X | | |
| 5 | Skills to design and conduct tests, collect data, analyze results, and interpret data for the experimental investigation of Electrical and Electronic Engineering problems | | 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. | | | |
| 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, innovation and sustainable development. | | | |
| 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:

3: Very high 2: Medium 1: None

Name of Instructor(s): Instructor Gökhan Dındış

Signature(s):

Date: 10-11-2014