

0205717 EMBEDDED SYSTEMS

Normal Education:

Evening Education:

Fall 2018-2019

**Course Format:** face-to-face

**COURSE DESCRIPTION**

**Credits :** *3 Credits (3+0)*

**ECTS**: *5*

**Required or elective:** *Elective for Computer Engineering Students*

**Catalog Description:** *This course covers embedded systems which can be defined as a control system or computer system designed to perform a specific task and designing embedded systems, use various sensors and system integration with peripheral equipments.*

**Prerequisites:** *None*

**Textbook(s) and/or required materials:**

*Steve McCarty, Setup, Programming and Developing Amazing Projects with Raspberry Pi for Beginners - With Source Code and Step by Step Guides (The Wonderful World of Engineering), 2017.*

*Güray Yıldırım, Rasberry Pi, Abaküs Kitap, 2016.*

**Course Objectives**

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| ***The objectives of this course are to:*** | |
| *1* | *To enable the students to select the necessary processor elements for their projects* |
| *2* | *To teach students to design projects with embedded systems* |
| *3* | *To teach students how to make connections between embedded systems and peripherals circuits* |
| *4* | *To teach students how to link visual programming and embedded system software* |

**Course Topics**

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| ***No*** |  |
| *1* | *Embedded system architecture, types and installation settings* |
| *2* | *Introduction to programming compuler and programming language* |
| *3* | *Input-Output ports usage and its applications* |
| *4* | *Various displaying units such as seven segment display and LCD and their applications* |
| *5* | *The use of Touch screen and its applications* |
| *6* | *The use of various sensors as DS18B20 and DTH 11* |
| *7* | *The use of step, servo and DC motors and their applications* |
| *8* | *Midterm Exam* |
| *9* | *Data transfer applications using NRF24, ATX -ARX-34* |
| *10* | *The use of RFID with Raspberry PI* |
| *11* | *The applications of Raspberry PI and Internet of Things* |
| *12* | *The applications of Raspberry PI and Internet of Things (continues)* |
| *13* | *Open CV settings and its system integrations* |
| *14* | *Image proccessing using Open CV and Raspberry PI* |

**Course Learning Outcomes**

*At the end of this course, students will be able to;*

* *Learn how to choose the processor element that is needed to solve real-time engineering problems.*
* *Determine the criterias that should be taken into account when designing optimum codes for systems design.*
* *Learn the system integration by connecting the embedded system with the peripheral units.*
* *Learn how to use touch screen (TFT), LCD and segment display and practice their applications.*
* *Provide information from outside with various sensors.*
* *Perform various wireless data transfer applications.*
* *Perform system control over the Internet with IOT applications.*
* *Perform image processing with the embedded system by learning Open CV.*

**Evaluation methods**

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| *1. Midterm Exam* | *40%* |
| *2. Final Exam* | *60%* |

***Professional component***

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| *Engineering topics* | *100%* |
| *General education* | *0%* |
| *Mathematics and basic sciences* | *0%* |

**Person(s) who prepared this description and date of preparation**

*Muhammet Nuri Seyman, June, 2018*

**Date of last revision**

*June 2018*