**ELEC4505 APPLIED DIGITAL SIGNAL PROCESSING  
COURSE CATALOG INFO**

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| **Course Code :**ELEC4505 | | | | | **Course Name :**Applied Digital Signal Processing | | | |
| **Semester** | | **Lecture + Laboratory + PS** | **Local Credit** | **ECTS** | **Language** | **Category** | **Instructional Methods** | **Prerequisites** |
|  | | (3+0+0) | 3 | 5 | English | Core | Course | ELEC3504 |
| **Course Content** | | | | Review of programming and simulation tools: Matlab and Simulink. Review of fundamentals of digital signal processing. Definition of basic signals in MATLAB. Sampling and reconsruction. A/D and D/A conversion. Difference equations. The Z-transform. Discrete convolution. Digital filter design. Frequency response of LTI systems. Discrete Time Fourier Transform (DTFT). Discrete Fourier Transform (DFT). Fast Fourier Transform (FFT). Audio, speech and image processing applications in MATLAB and Simulink. | | | | |
| **Course Outcomes** | | | | **CO 1.** Explain the fundamental properties and representations of the discrete time signals and systems.  **CO 2.** Design the digital filters using filter design tools in MATLAB.  **CO 3.** Compute the Discrete Fourier Transform using FFT algorithms.  **CO 4.** Apply some advanced digital signal processing algorithms and methods to audio, speech and image processing areas. | | | | |
|  | **Program Outcomes** | | | | | | | |
| **PO1** | Adequate knowledge in fundamentals of mathematics (algebra, differential equations, integrals, probability etc), science (physics, chemistry, biology etc.) and computer science (programming and simulation); ability to use theoretical and applied knowledge in these areas in complex engineering problems. | | | | | | | |
| **PO2** | Ability to identify, define, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose. | | | | | | | |
| **PO3** | Ability to design and integrate components of a complex system or process, as they relate to Electrical and Electronics Engineering discipline, under realistic constraints and conditions, in such a way as to meet desired requirements; ability to apply modern design methods. | | | | | | | |
| **PO4** | Ability to devise, select, and use techniques and tools needed for analyzing and solving complex problems encountered in engineering practice; ability to employ information technologies effectively. | | | | | | | |
| **PO5** | Ability to design and conduct experiments, gather, analyze and interpret data. | | | | | | | |
| **PO6** | Ability to work in intra-disciplinary and multi-disciplinary teams; ability to take individual responsibilities. | | | | | | | |
| **PO7** | Ability to effectively communicate in Turkish, ability to express his/her knowledge, ideas and work in English via oral, written and visual means; ability to write effective reports and comprehend written reports; ability to give and follow instructions. | | | | | | | |
| **PO8** | Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself. | | | | | | | |
| **PO9** | Consciousness to behave according to ethical principles, and about professional and ethical responsibility; knowledge on standards used in engineering practice. | | | | | | | |
| **PO10** | Knowledge about business life practices such as project management, risk management, and change management; awareness in entrepreneurship, innovation; knowledge about sustainable development. | | | | | | | |
| **PO11** | Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions. | | | | | | | |

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| **CONTRIBUTION OF COURSE OUTCOMES ON ELECTRICAL AND ELECTRONICS ENGINEERING PROGRAM OUTCOMES** | | | | | |
| **Course\Program** | **CO1** | **CO2** | **CO3** | **CO4** |  |
| **PO1** |  |  |  |  |  |
| **PO2** |  |  |  |  |  |
| **PO3** |  |  |  |  |  |
| **PO4** |  |  |  |  |  |
| **PO5** |  |  |  |  |  |
| **PO6** |  |  |  |  |  |
| **PO7** |  |  |  |  |  |
| **PO8** |  |  |  |  |  |
| **PO9** |  |  |  |  |  |
| **PO10** |  |  |  |  |  |
| **PO11** |  |  |  |  |  |

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| **COURSE ASSESMENT AND ECTS WORK LOAD** | | | |
| **Type of Work** | **Count** | **ECTS WORK LOAD** | |
| **Time (Hour)(Including prep. time)** | **Work Load** |
| Attendance | 14 | 3 | 42 |
| Final Exam | 1 | 2 | 2 |
| Quizzes |  |  | 0 |
| Term project |  |  | 0 |
| Reports |  |  | 0 |
| Final Project |  |  | 0 |
| Seminar |  |  | 0 |
| Assignments |  |  | 0 |
| Presentation |  |  | 0 |
| Midterms |  |  | 0 |
| Project |  |  | 0 |
| Laboratory |  | 0 | 0 |
| Tutorial |  | 0 | 0 |
| Other(Self study) |  |  | 0 |
|  | | **Total work load** | 44 |
|  | | **Total work load/25** | 1.76 |
|  | | **ECTS Credit** | 2 |