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| http://euhr.edu.eg/Files/170/Logo.jpg كلية الهندسة بشبرا | Model No.12 Course Specifications : Signal Analysis |  |
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| **University** : Benha university |

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| **Faculty** : Faculty of Engineering - Shoubra |

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| **Department** : Electrical Engineering Department |

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| **1- Course Data** |
| |  |  |  |  | | --- | --- | --- | --- | | Course Code : ECE221 | Course Title : Signal Analysis | Study Year : 2nd year communication. | | | Specialization : |  | | | | Teaching Hours: | | | | | Lecture : 4 | Tutorial : 2 | Practical: |  | |

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| **2-  Course Aim** |
| For students undertaking this course, the aims are to: |
| |  | | --- | | 2.1- By the end of the course the students will be able to: Represent continuous-time and discrete-time signals in both time and frequency domains. | | 2.2- Be able to analyze signals using Fourier series, Fourier transform (continuous and discrete). | | 2.3- Represent CT signals by its samples and analyze the spectrum. | | 2.4- Completely understand energy and power spectrum. | |

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| **3- Intended Learning Outcomes of Course (ILOS)** |
| |  | | --- | | **a-  Knowledge and Understanding** | | On completing this course, students will be able to: | | |  | | --- | | a- 1 - Recognize Concepts and theories of mathematics and sciences, appropriate to the signal analysis. | | a- 5 - Demonstrate methodologies of solving engineering problems, data collection interpretation. | |  | | |  | | | **b-  Intellectual Skills** |  | | At the end of this course, the students will be able to: |  | | |  | | --- | | b- 1 - Select appropriate mathematical and computer-based methods for modeling and analyzing problems. | | b- 2 - Select appropriate solutions for engineering problems based on analytical thinking. | | b- 3 - Think in a creative and innovative way in problem solving and design. | | b- 4 - Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. | |  | |  | | | **c-  Professional Skills** |  | | On completing this course, the students are expected to be able to: |  | | |  | | --- | | c- 1 - Apply knowledge of mathematics, science, information technology, design, business context and engineering practice to solve engineering problems | | c- 5 - Use computational facilities, measuring instruments, workshops and laboratories equipment to design experiments and collect, analyze and interpret results. | | c- 6 - Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the signal analysis and develop required computer programs. | | c- 7 - Apply numerical modeling methods to engineering problems. | | c- 13 - Use appropriate mathematical methods or IT tools. | |  | |  | | | **d-  General Skills** |  | | At the end of this course, the students will be able to: |  | | |  | | --- | | d- 5 - Lead and motivate individuals. | | d- 6- Effectively manage tasks, time, and resources. | | d- 9 - Refer to relevant literatures. | | d- 12 - Develop skills related to creative and critical thinking as well as problem solving | |  | |  | | |

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| **4- Course Contents** |
| |  |  | | --- | --- | | **No.** | **Topics** | | 1 | Fundamental of signals | | 2 | Continuous-time and discrete-time signals, signal energy and power, some basic operations. | | 3 | Exponential and sinusoidal signals, some elementary signals | | 4 | Fourier-series representation of continuous-time periodic signals and its properties | | 5 | Fourier-series representation of discrete-time periodic signals and its properties | | 6 | The continuous-time Fourier transform | | 7 | The continuous-time Fourier transform properties | | 8 | The discrete-time Fourier transform | | 9 | The discrete-time Fourier transform properties | | 10 | Sampling and Spectrum analysis | | 11 | Energy and power spectra | | |

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| **5- Teaching and Learning Methods** |
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| |  | | --- | | 5.1- Lectures | | 5.2- Class activity | | 5.3-  workshop | | 5.4-  Seminar | |

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| **6- Teaching and Learning Methods of Disables** |
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| **7- Student Assessment** |
| |  | | --- | | **a- Student Assessment Methods** | | |  |  | | --- | --- | | 1 | Assignments   to assess   a1,a5,b1,b2,b3,c1,c5,c6,d5,d6,d9 | | 2 | Quiz   to assess   a1,a5,b1,b3,c1,d6 | | 3 | Mid-term exam   to assess   a5,b1,b3,c1,d6 | | 4 | Oral exam   to assess   a1,a5,b1,b2,b3,c1,c5,d6 | | 5 | Final exam   to assess   a1,a5,b1,b2,b3,c1,c5,d6 | | |  | | | **b- Assessment Schedule** |  | | |  |  |  | | --- | --- | --- | | **No.** | **Assessment** | **Week** | | 1 | Assignments on weeks | 4,6,7,9,10,13 | | 2 | Quizzes on weeks | 5,12 | | 3 | Mid-term exam on week | 8 | | 4 | Oral Exam on week | 14 | | 5 | Final exam on week | 15 | |  | |  | | | **c- Weighting of Assessments** |  | | |  |  | | --- | --- | | **Assessment** | **Weight** | | Mid\_Term Examination | 10 % | | Final\_Term Examination | 60 % | | Oral Examination | 20 % | | Practical Examination | 0 % | | Semester work | 5 % | | Other types of assessment | 5 % | | Total | 100 % | |  | |  | | |

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| **8- List of References** |
| |  | | --- | | **a- Course Notes** | | |  | | --- | | 1-  Course Notes | | | **b- Books** | | |  | | --- | | 1- Alan V.Oppenheim, Alan S.Wilsky, Signals and systems, 2nd edition, Prentice Hall, 1997 | | 2- Simon Haykin, Barry Van Veen, Signals and systems, 2nd edition, Wiley India Pvt. Limited, 2007 | | | **c- Recommended Books** | | |  | | --- | | 1- James H. McClellan, Ronald W. Schafer, Mark A.Yoder, DSP first: a multimedia approach, Prentice Hall, 1998 | | | **d- Periodical** | | |  | | --- | | 1- Mathworks | | |  | |  | |  | |  | |  | |

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| **- Course Coordinator :    Rokaia Mounir Zaki Emam** |

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| **سيد ابو السعود سيد ورد- Head of Department :** |

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| http://euhr.edu.eg/Files/170/Logo.jpg كلية الهندسة بشبرا | Model No.11A Course Specifications : Signal Analysis |  |
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| **University** : Benha university |

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| **Faculty** : Faculty of Engineering - Shoubra |

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| **Department** : Electrical Engineering Department |

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| **Matrix of Knowledge and Skills of the course** |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **No.** | **Topics** | **week** | **Basic Knowledge** | **Intellectual Skills** | **Professional Skills** | **General Skills** | | 1 | Fundamental of signals | 1 | a5 | b1 | c1,c5 | d9 | | 2 | Continuous-time and discrete-time signals, signal energy and power, some basic operations. | 2 | a5 | b1 | c1,c5 | d9 | | 3 | Exponential and sinusoidal signals, some elementary signals | 3 | a5 | b2,b3 | c1,c5 | d5,d9 | | 4 | Fourier-series representation of continuous-time periodic signals and its properties | 4 | a1,a5 | b2,b3 | c1,c6 | d5,d9 | | 5 | The continuous-time Fourier transform | 5 | a1,a5 | b1,b3 | c1,c6 | d5,d9 | | 6 | The continuous-time Fourier transform properties | 6 | a1,a5 | b1,b3 | c1,c6 | d5,d9 | | 7 | The Frequency Response of Continuous-Time LTI Systems | 7 | a1 | b1,b3 | c1,c6 | d5,d9 | | 8 | Midterm | 8 | a1,a5 | b1,b2,b3 | c1,c5,c6 | d6,d12 | | 9 | Fourier-series representation of discrete-time periodic signals and its properties | 9 | a1,a5 | b1,b3 | c1,c5 | d5,d9 | | 10 | The discrete-time Fourier transform | 10 | a1,a5 | b1,b3 | c1,c5 | d5,d6,d9 | | 11 | The discrete-time Fourier transform properties | 11 | a1,a5 | b1,b3 | c1,c6 | d5,d6,d9 | | 12 | Sampling and Spectrum analysis | 12 | a1,a5 | b2,b3 | c1,c6 | d5,d6,d9 | | 13 | Energy and power spectra | 13 | a1,a5 | b2,b3 | c1,c5 | d5,d6,d9 | | 14 | Oral exam | 14 | a1,a5 | b1,b2,b3 | c1,c5 | d6,d12 | | 15 | Final exam | 15 | a1,a5 | b1,b2,b3 | c1,c5,c6 | d5,d6,d9,d12 | |

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| **- Course Coordinator :    Rokaia Mounir Zaki Emam** |

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