|  |  |  |
| --- | --- | --- |
| http://euhr.edu.eg/Files/170/Logo.jpgكلية الهندسة بشبرا | Model No.12Course Specifications : Signal Analysis |   |
|  |

|  |
| --- |
| **University** : Benha university |

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

|  |
| --- |
| **Department** : Electrical Engineering Department |

|  |
| --- |
| **1- Course Data**  |
|

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

 |

|  |
| --- |
| **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.  |

 |

|  |
| --- |
| **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  |

 |  |
|  |

 |

|  |
| --- |
| **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  |

 |

|  |
| --- |
| **5- Teaching and Learning Methods**  |
|  |
|

|  |
| --- |
| 5.1- Lectures  |
| 5.2- Class activity  |
| 5.3-  workshop  |
| 5.4-  Seminar  |

 |

|  |
| --- |
| **6- Teaching and Learning Methods of Disables** |
|  |
|

|  |
| --- |
| 6.1- not found  |

 |

|  |
| --- |
| **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 % |

 |  |
|  |

 |

|  |
| --- |
| **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  |

 |
|  |
|  |
|  |
|  |
|  |

 |

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

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

|  |  |  |
| --- | --- | --- |
| http://euhr.edu.eg/Files/170/Logo.jpgكلية الهندسة بشبرا | Model No.11ACourse Specifications : Signal Analysis |   |
|  |

|  |
| --- |
| **University** : Benha university |

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

|  |
| --- |
| **Department** : Electrical Engineering Department |

|  |
| --- |
| **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 |

 |

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

|  |  |
| --- | --- |
|

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

 |