|  |  |  |
| --- | --- | --- |
| **جامعة فلسطين التقنية – خضوري**  **دائرة الجودة والنوعية**  **طولكرم- ص.ب 7**  **هاتف:  فاكس: 2677922/09**  **بريد إلكتروني:** [**quality@ptuk.edu.ps**](mailto:quality@ptuk.edu.ps) | Untitled | **Palestine Technical University -Kadoorie**  **Quality Department**  **Tulkarm-P.O. Box: 7**  **Tel: 09/2761026 – 09/l2677923**  **Fax: 09/2677922**  **Email: quality@ptuk.edu.ps** |

**Course Specification Template**

**1. General information about Instructor:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Dr. Arafat Zaidan**  **Eng. Shahd Sukar,** | | | **Class Time & Office Hours** | | | | |
| **Phone** | **Internal** |  | **Day** | SUN | MON | TUE | WED | THU |
| **External** |  |  |  |  |  |  |  |
| **Mobile** |  | | **Class Time** |  |  |  |  |  |
| **Instructor's E-mail** | **arafatzaidan@**  **Ptuk.edu.ps** | | **Class Room** |  |  |  |  |  |
|  | | **Office Hours** |  |  |  |  |  |

**2. General information about the Course**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Requirements** |  | | | | | |
| **1** | Course Title | **Control System** | | | | | |
| **2** | Course code & Number | **12210355** | | | | | |
| **3** | Credit hours | Theo. (CH): **3** | | | Practical (CH): | | |
| **4** | Faculty | **Engineering** | | | | | |
| **5** | Department / Division that offers the course: | **Mechatronics** | | | | | |
| **6** | Course type | Compulsory | | | Elective | | |
| Uni. | Fac. | Dep. | Uni. | Fac. | Dep. |
| **7** | Level and Semester | **Level 3 every semester** | | | | | |
| **8** | Prerequisite(s) – If any | **Engineering Math (2)** | | | | | |
| **9** | Co-requisite(s) – if any | Non | | | | | |
| **10** | Program/programs for it/them the course is offered | **All engineering programs except Civil** | | | | | |
| **11** | Instruction Medium: | English | | | Arabic | | |

**3. Course description:**

|  |
| --- |
| This course aims to provide students with the principles of control systems and understanding of control concepts such as open and closed loops (feedback) control systems. Modeling of physical systems: electrical, mechanical systems. System representations: System block diagrams and signal flow graphs. State variable models. Feedback control system characteristics. Performance of feedback control systems. Routh-Hurwitz stability. Steady state error coefficient |

**4. General Course Objectives**

|  |  |
| --- | --- |
| **On successful completion of this course the student will be able to achieve the following objectives:**   |  | | --- | | 1. Introduce the student to electrical/mechanical systems 2. Introduce students to the concept of modeling 3. Apply knowledge of math to engineering 4. Solve classical control problems | |

**5. Intended Learning Outcomes/ILO’s (please specify the learning outcomes of the course as outlined below):**

|  |
| --- |
| 1. ability to apply knowledge of math engineering and science 2. ability to identify, formulate and solve engineering problems 3. ability to use techniques, skills and tools in engineering practice 4. ability to work with electrical and mechanical systems 5. Ability to write models for electrical and mechanical systems |

**6. Topics covered and Calendar:**

1. **Theoretical parts (Please state the titles of the subjects you intend to cover each week)**

|  |  |  |
| --- | --- | --- |
| **No.** | **Topics** | **No. of hours** |
|  | INTRODUCTION (CHAPTER 1 IN THE COURSE TEXT) | 3 |
|  | LAPLACE TRANSFORMS | 6 |
|  | MATHEMETICAL MODELLING OF PHYSICAL SYSTEMS (CHAPTER 2) | 12 |
|  | BLOCK DIAGRAMS AND SIGNAL FLOW ANALYSIS (CHAPTERS 3 ,4) | 6 |
|  | STATE VARIABLE MODELS AND FEEDBACK CONTROL SYSTEMS CHARACTERISTICS (CHAPTERS 3&4). | 6 |
|  | THE STABILITY OF LINEAR CONTROL SYSTEMS (CHAPTER 6) | 3 |
|  | PERFORMANCE OF FEEDBACK CONTROL SYSTEMS .TIME DOMAIN ANALYSIS (CHAPTER 5). | 3 |
|  |  |  |

**7. Student assessment methods based on ILO,s**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Assessment method** | **Week** | **Mark** | **Percentage to overall mark** |
|  | First Exam |  | **30** | **30%** |
|  | Second Exam |  | **30** | **30%** |
|  | Mid-term Exam (if any) |  | **35 (for elect term)** |  |
|  | Coursework |  | **20 (for elect term)** |  |
|  | Final Exam |  | **40/45** | **40%** |

**8. References and other resources**

|  |
| --- |
| 1. **Recommended Textbook(s): two maximum** 2. **Richard C. Dorf, Robert H. Bishop “ Modern Control Systems”** |
| 1. **Other references** 2. **Ogata, “Modern Control Engineering”, Second edition, Prentice Hall, 1990** 3. **W.L.Brogan, “Modern Control Theory”, Second edition, Prentice Hall, Englewood Cliffs. N.I, 1985** 4. **Phillips Harbor, “Feedback Control Systems”, second edition, Prentice-Hall, 1991.** 5. **James R. Rowland, “Linear Control Systems Modeling, Analysis and design”, John Wiley and sons, inc, 1986.** 6. **Benjamin Kuo and Farid Colnarahgi,” Automatic Control Systems”, John Wiley and sons, Inc., Eighth Edition, 2003.** |
| 1. **Electronic resources, Websites related to the course** |

**Course Tutor’s name and signature**

Name: Dr. Arafat Zaidan Signature Date:01/01/2024

**Name & signature of Quality rep. in your faculty**

Name: …………………………… signature: …………………………Date: ……………….

**Name & signature of Head of department/ program leader**

Name: …………………………… signature: …………………………Date: ……………….