# Jordan University of Science and Technology

## Faculty of Engineering

## Mechanical Engineering Department

| ME462 Automatic Control |
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| Summer Semester 2019-2020 |

| Course Catalog |
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| 3 Credit Hours. System modeling. Transfer functions, block diagrams and signal flow graph. Time domain analysis, transient response, steady-state error, stability and sensitivity. Routh's stability criterion. Root locus. Frequency domain analysis, Bode plots. Control system design by compensation.? |

| Text Book | |
|---|---|
| **Title** | Modern Control Systems |
| **Author(s)** | R. C. Dorf and R. H. Bishop |
| **Edition** | 12th Edition |
| **Short Name** | Text |
| **Other Information** | |

**Course References**

| Short name | Book name | Author(s) | Edition | Other Information |
|---|---|---|---|---|
| Ref#1 | Feedback Control of Dynamic Systems | Franklin & Emami | 8th Edition | |
| Ref#2 | Control Systems Engineering | Nise | 5th Edition | |

| Instructor | |
|---|---|
| Name | **Prof. Saleh Radaideh** |
| Office Location | E1L3 |
| Office Hours | |
| Email | srad@just.edu.jo |

| Class Schedule & Room |
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Section 1:
Lecture Time: Sun, Mon, Tue, Wed : 10:00 - 11:30
Room: منصة الكترونية

| Tentative List of Topics Covered | | |
|---|---|---|
| **Weeks** | **Topic** | **References** |
| Weeks 1, 2 | Introduction to Control Systems | From **Text** |
| Week 3 | System Modelling and Laplace Transform | |
| Weeks 4, 5 | Block Diagrams and Signal- flow graphs models | |
| Weeks 6, 7, 8 | Characteristics and Performance of Feedback Systems | |
| Week 9 | System Stability | |
| Weeks 10, 11, 12 | Root Locus Methods and PID controller design | |
| Week 13 | Compensator design | |
| Weeks 14, 15, 16 | Response and Stability in Frequency Domain | |

| Mapping of Course Outcomes to Program Student Outcomes | Course Outcome Weight (Out of 100%) | Assessment method |
|---|---|---|
| Formulate the mathematical model for a given systems and obtain the system transfer function, utilizing the block diagram and signal flow graph techniques. [1SLO1] | 23% | |
| analyze open loop and closed loop systems characteristics [1SLO1] | 23% | |
| Design appropriate controller ( P,PI,PD, and PID ) for given design specifications using root locus method. [1SLO2] | 43% | |
| Use Matlab to simulate, analyze and design of feedback control systems. [1SLO7] | 11% | |

| Relationship to Program Student Outcomes (Out of 100%) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | D | E | F | G | H | I | J | K | SLO1 | SLO2 | SLO3 | SLO4 | SLO5 | SLO6 | SLO7 |
| | | | | | | | | | | | 46 | 43 | | | | | 11 |

| Evaluation | |
|---|---|
| **Assessment Tool** | **Weight** |
| Home Works | 20% |
| Final | 60% |

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| Quizez | 20% |

| Policy | |
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| Attendance | University policy will be followed (allowed absence is less than 20%) |

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