

**Summarized Course Description**

Course number: ECE 330	Course name: Control Systems
لغة تدريس المقرر : English	Pre-requisites: ECE 270
Credit hours: 3 (3+ 0 + 0 )	Course level: Level 8 - Fourth Year

**Course Description**

وصف المقرر :

Introduction to control systems. Representation of physical control system elements. Transfer functions, Signal flow graphs. State space analysis. Sensitivity, static accuracy and transient response. Stability of control systems : Routh criterion, Root locus, Frequency response methods, Nyquist stability criterion. Compensation techniques. Introduction to digital control and the Z transform. Discrete time control system.

**Course objectives**

أهداف المقرر :

Students will be able to:

- Develop mathematical models for linear dynamic systems in continuous and discrete time
- Use time domain and frequency domain tools to analyze and predict the behavior of linear systems.
- Use time domain and frequency domain techniques to design feedback compensators to achieve a specified performance criterion.
- Use MATLAB for system analysis and design.

**Course Outcomes**

مخرجات التعليم:

On successful completion of this course, the students will have developed

- knowledge and understanding of
  - i) essence of using feedback and structure of feedback systems
  - ii) basic principles of control system analysis in the time-domain
  - iii) basic principles of control system analysis in the frequency-domain
- their skills in:
  - i) evaluating transient and steady-state responses of control systems
  - ii) designing basic controllers
- their appreciation of and respect for values and attitudes regarding the issues of:
  - i) feedback
  - ii) reliability and economy in control system design

**Textbook and references**

الكتاب المقرر والمراجع المساندة:

Book	Authors	Publisher	Publication year
Modern Control Systems, 13 <sup>th</sup> edition.	Richard C. Dorf and Robert H. Bishop	Pearson	2017
Automatic Control Systems, 9 <sup>th</sup> edition	FARID GOLNARAGHI, BENJAMIN C. KUO	JOHN WILEY & SONS, INC.	2010
Feedback Control of Dynamic Systems 8th Edition	Gene F. Franklin J. David Powell, Abbas Emami-Naeini	Pearson	2019