Benha University
Shoubra Faculty of Engineering
Industrial Engineering Department

Course Specification

Automatic Control Synthesis and Design

Course Specifications

Program(s) in which the course is given: Industrial Engineering
Major or minor element of programs: N/A
Department offering the program: Industrial Engineering
Department offering the course: Mechanical Engineering
Academic year / Level: 2009/2010 / Level

Date of specification approval:

A- Basic Information

Title: Automatic Control Synthesis and Design Code: IND 306
Credit Hours:
Lecture: 2
Exercises: 2
Total: 4 contacts 3 Credits

B- Professional Information

1- Overall aims of the course

This cours aims to deepen the concepts of control Engineering Design using MATLAB. It presents a comprehensive treatment of the analysis and design of continuous – time control system.

2- Intended learning outcomes of the course (ILOs)

a. Knowledge and understanding

By the end of this course the student should be able to
-Understand the requirements of automatic control system
- describe the conventional and modern control strategy.
- know the available software for system design.

b. Intellectual skills

☒ Analysis ☒ Creative thinking ☒ Problem solving

c. Professional and practical skills

☐ Managing
☒ Computer program
☒ Ability to identify the problem
☐ Ability to estimate cost
☒ Engineering design
☐ Ability to diagnose
☐ Other

d. General and transferable skills

☒ Computing
☐ Management
☒ Use of technological tools
☒ Communication
☒ Working in group

3- Contents

Topic	No. of hours	Lecture	Tutorial/ Practical
State space representation	8	4	4
Control system design by frequency response	12	6	6
PID control	12	6	6
Analysis of control system in state space	12	6	6
Design of control system in state space	16	8	8
Total	**60**	**30**	**30**

4- Teaching and learning methods

- ☐ Information collection
- ☒ Research assignment
- ☒ Lecture
- ☒ Class activities
- ☒ Discussions
- ☐ Field visit
- ☐ Practical training / lab
- ☐ Case study

5- Student assessment methods

Class attendance and participation
Homework assignments
First midterm exam
Final exam

Assessment schedule

Homework assignments	weeks 3, 5, 7, 9, 11
First midterm exam	week 8
2th midterm exam	week 12
Final exam	week 15

Weighting of assessments

Final	40 %
7th week Exam	30 %
12th week Exam	20 %
Class attendance and participation	5 %
Homework assignments	5 %

6- List of references

6.1 Course notes

6.2 Essential books

- **Katsuhiko Ogata (modern control Engineering)**
- **Prentice Hall , 3rd edition , 1997**
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6.3 Recommended books

- **Rae V. Dukkipati, (analysis and design of control system)**
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7- Facilities required for teaching and learning

Computer Lab (students have their own laptop)
Data Show √
Overhead Projector

Course Coordinator: Dr. Yehia El Mashed
Program Coordinator: Prof. Dr. Attia Gomaa
General Supervisor & Vice Dean: Prof. Dr. Abdallh Saad
Date: 01 / 06 / 2010