Course Specifications – Control Engineering E351

University: Benha University
Faculty: Benha Faculty of engineering

Course specifications
Program(s) on which the course is given: Electrical Engineering Technology Dep. (Electrical Power & Machines Branch)
Major or minor element of programs: Major
Department offering the program: Electrical Engineering technology Dep.
Department offering the course: Electrical Engineering technology Dep.
Academic year / Level: Third year
Date of specification approval: 2008

A- Basic Information
Title: Electrical Machines
Code: E351
Credit Hours: N.A.
Lecture: 2
Tutorial: 2
Practical: -
Total: 4

B- Professional Information
1 - Overall aims of course
Upon successful completion of this course, the student should be able to demonstrate knowledge of block diagram and transfer function- nonlinearities- damping and instability- criteria of good control. Types of control; analog and digital. Laplace transforms and transfer functions. Impulse response and Transfer Functions of linear systems, Mathematical modeling of physical system. Stability of linear control systems, and Time Domain Analysis of Control Systems.

2- Intended Learning Outcomes of course (ILOs)
a. Knowledge and understanding:
Review the following items:
a.1 The different control systems, types of feed back control systems.
a.2 Impulse response and Transfer Functions of linear systems.
a.3 Mathematical modeling of physical system.
a.4 Stability of linear control systems, and Time Domain Analysis of Control Systems.
b. Intellectual skills

By the end of this course, the student should be able to:

b.1 Study of real control Systems and their applications.

b.2 Review of the mathematical foundations used in control systems.

c- Professional and practical skills

By the end of this course, the student should be able to:

c.1 Use basic instruments that measure and control industrial quantities.

c.2 Perform simple Lab experiments on the control engineering.

c.3 Extract information from collected data in the lab.

d- General and transferable skills

By the end of this course, the student should be able to:

d.1 Work cooperatively and effectively in a group,

d.2 Find information independently.

3- Contents

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<th>Topic</th>
<th>Lecture Hours</th>
<th>Tutorial Hours</th>
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<td>4</td>
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<td>Control systems, types of feedback control systems</td>
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<tr>
<td>Impulse response and Transfer Functions of linear systems.</td>
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<td>State variable analysis of linear dynamic systems</td>
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<td>Stability of linear control systems</td>
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<td>Time Domain Analysis of Control Systems</td>
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<td>Total numbers</td>
<td>15</td>
<td>30</td>
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4- Teaching and learning methods
Lectures,
Tutorials,
Practice in Laboratories,
Internet collected information and Self-study projects.

5- Student assessment methods
Written exams (Final and Midterm), assignments and quizzes to assess knowledge and understanding, solving problems skills and interpretation capabilities of physical phenomena.
Oral exams to assess the abilities of discussing physical concepts.
Practical exam to assess measuring and professional skills.

Assessment schedule
Quiz 1  .........................Week No.  5
Midterm  ....................... Week No. 10
Quiz 2  .........................Week No. 12
Oral and Practical exam.........Week No. 14
Final written exam ..............Week No. (According to Exam-Plan)

Weighting of assessments
Mid-term examination  10%
Oral and Practical examination  20%
Semester work  10%
Final-term examination  60%
Total  100%

6- List of references
6. a Lecture notes
6. b Lab notes
6. c Recommended books
   1- Modern Control Engineering. (Ogata)
   2- Automatic Control Systems (Kuo).
   3- Any other Suitable Books on the Control Engineering.

7- Facilities required for teaching and learning
   a- Lecture rooms
   b- Tutorial section rooms
   c- Experimental Labs
   d- Computer Labs
   e- Virtual simulation programs
Course coordinator: Dr. Abdel-Nasser Nafeh.

Head of Department: Ass. Prof. Ghada Amer.

Date: 5/2/2009