University/Academy: Arab Academy for Science and Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: Electrical and Control Engineering

Form no. (12)
Course Specification

1- Course Data

Course Code:	**Course Title:**	**Academic Year/Level:**
EE 412	Control Systems II	4
Specialization:	**No. of Instructional Units:**	**Lecture** 2
Electrical and Control Engineering	3	**Tutorial/Practical** 2

2- Course Aim	Enhancement of the skills related to developing to the state space models and nonlinear control system.
3- Intended Learning Outcome	
a- Knowledge and Understanding	A.4 Principles of design including elements design, process and/or a system related to specific disciplines A.5 Methodologies of solving engineering problems, data collection and interpretation A.15 Principles of operation and performance specifications of electrical and electromechanical engineering systems A.27 Analysis, design and implementation of various methods of control using analogue and digital control systems A.31 Formulate the problem, realizing the requirements and identifying the constraints

b- Intellectual Skills	B.1 Select appropriate mathematical and computer-based methods for modeling and analyzing problems B.2 Select appropriate solutions for engineering problems based on analytical thinking B.3 Think in a creative and innovative way in problem solving and design B.8 Select and appraise appropriate ICT tools to a variety of engineering problems B.11 Analyze results of numerical models and assess their limitations B.19 Design computer programs to analyze and simulate different electrical systems components and control applications
c- Professional Skills	C.1 Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems C.5 Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results C.6 Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs C.13 Design and perform experiments, as well as analyze and interpret experimental results related to electrical power and machines systems C.14 Use laboratory and field equipment competently and safely C.16 Specify and evaluate manufacturing of components and equipment related to electrical power and machines
d- General Skills	D.3 Communicate effectively D.4 Demonstrate efficient IT capabilities

4- Course Content	*Week 1*:Topics and definitions *Week 2*:Models of linear systems *Week 3*:Representation using phase variables *Week 4*:State space representation using canonical variables *Week 5*:Properties of transition matrix *Week 6*:Poles/Zero eigen values *Week 7*:Pole-placement in state feedback *Week 8:*Pole-placement in state feedback *Week 9:*Introduction to nonlinearity *Week 10:*Common non linearties *Week 11:*Describing function method *Week 12:*Limit cycle *Week 13:*The phase plane method *Week 14:*The phase plane method *Week 15:*The phase plane method
5- Teaching and Learning Methods	- Lectures - Tutorials - Discussion papers - Practical Training
6- Teaching and Learning Methods for Students with Special Needs	- Lectures - Tutorials - Discussion papers - Practical Training

7- Student Assessment:	
a- Procedures used:	Quizzes to assess the 7th week evaluation Quizzes to assess the 12th week evaluation Matlab code to asses class activities
b- Schedule:	Assesssment 1 — 4th Week Assesssment 2 — 5th Week Assesssment 3 — 7th Week Assesssment 4 — 10th Week Assesssment 5 — 12th Week Assesssment 6 — 15th Week
c- Weighing of Assessment:	7th Week Examination — 30% 12th Week Examination — 15%+5%practical Final-term Examination — 40% Oral Examination — 0% Semester Work — 10% Total — 100%
8- List of References:	• Richard C. Dorf, "Modern Control Systems" • Katsuhkp Ogata, "Modern Control Eng."
a- Course Notes	
b- Required Books (Textbooks)	Benjamin C. Kuo, "Automatic Control Systems", Prentice Hall, Inc.
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Course Instructor

Name: **Dr.Mostafa Abdelgelil**

Signature:

Head of Department

Name: **Prof. Hamdy Ashour**

Signature:

Dean of College of Engineering and Technology of AASTMT

Name: **Prof. Moustafa Hussein Aly**

Signature:

Executive Manager of Quality Assurance Center of AASTMT

Name: **Prof. Aziz Ezzat**

Signature: