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

Form no. (12)
Course Specification

1- Course Data

Course Code:	**Course Title:**	**Academic Year/Level:**
EE 342	Power System I	3

Specialization:	**No. of Instructional Units:**		
Electrical & Control Engineering	3	**Lecture**	2
		Tutorial	2

2- Course Aim	To introduce to the students good knowledge on per unit system. - To apply different numerical methods for solving the power flow problem. - To inform the student of different types of power system control. - To introduce the students to the different methods of optimal dispatch of thermal generation.
3- Intended Learning Outcome	
a- Knowledge and Understanding	A.1 Concepts and theories of mathematics and sciences, appropriate to the discipline A.5 Methodologies of solving engineering problems, data collection and interpretation A.23 Principles of performing electrical system calculations, including load flow, earthling and equipment sizing A.26 Design and analysis of power system generation, transmission and distribution 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.8 Select and appraise appropriate ICT tools to a variety of engineering problems B.10 Incorporate economic, societal, environmental dimensions and risk management in design 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.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
d- General Skills	D.4 Demonstrate efficient IT capabilities D.7 Search for information and engage in life-long self learning discipline

4- Course Content According to Course Matrix (**Form 11a**), Course File Summary (**ISO MPC 3/2-1** and session Plan (**ISO MPC 3/3-1**)	*Week Number 1:* Single line diagram of power system. *Week Number 2:* The per unit system. *Week Number 3:* Bus admittance matrix. *Week Number 4:* Bus impedance matrix. *Week Number 5:* Power flow equations. *Week Number 6:* Gauss- Seidel power flow solution *Week Number 7:* Gauss- Seidel power flow solution. *Week Number 8:* Newton Raphson power flow solution. *Week Number 9:* Newton Raphson power flow solution. *Week Number 10:* Synchronous generator for power control. *Week Number 11:* Tap changing transformers. *Week Number 12:* Non linear function optimization. *Week Number 13:* Economic dispatch neglecting losses and no generator limits. *Week Number 14:* Economic dispatch neglecting losses and including generator limits. *Week Number 15:* Economic dispatch including losses. *Week Number 16:* Final Exam
5- Teaching and Learning Methods	- Lectures - Tutorials - Reports & sheets - Laboratories - Seminars
6- Teaching and Learning Methods for Students with Special Needs	- Lectures - Tutorials - Reports & sheets - Laboratories - Seminars - Condensed office hours
7- Student Assessment:	Written Examinations to asses The Intended Learning Outcomes Class Activities (Reports, Discussions, ------) to asses The Intellectual Skills
a- Procedures used:	Written Examinations to asses The Intended Learning Outcomes Class Activities (Reports, Discussions, ------) to asses The Intellectual Skills

b- Schedule:	Assessment 1	7th Week Written Exam
	Assessment 2	12th Week Written Exam
	Assessment 3	Continuous Assessments
	Assessment 4	16th Week Final Written Exam
c- Weighing of Assessment:	7th Week Examination	30 %
	12th Week Examination	20 %
	Final-term Examination	40 %

	Oral Examination 0 % Practical Examination 0 % Semester Work 10 % Total 100%
8- List of References:	Guile & W. Paterson , " Electrical power systems " , vol. I & II Pregamaon press , London , 1980 W. Stevenson & J.Grainger , " power system Analysis" , McGraw Hill , 1994
a- Course Notes	
b- Required Books (Textbooks)	Hadi Saadat, "Power System Analysis", McGraw- Hill, 2002
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Course Instructor

Name: **Dr. Amani Hanafi**

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: