



# Course Specifications

Muharram 1437 H

Institution:	Majmaah University
Academic Department :	Electrical Engineering
Programme :	Power & Machines Track
Course :	Power Systems Analysis
Course Coordinator :	Dr.Praveen R.P.
Programme Coordinator :	.....
Course Specification Approved Date :	25/ 3/ 1437 H



## A. Course Identification and General Information

1 - Course title : <b>Power Systems Analysis</b>	Course Code: <b>EE372</b>	
2. Credit hours : ( 3 )		
3 - Program(s) in which the course is offered: <b>Electrical Engineering (Power &amp; Machines Track)</b>		
4 – Course Language : <b>English</b>		
5 - Name of faculty member responsible for the course: <b>Dr.Praveen R.P.</b>		
6 - Level/year at which this course is offered : <b>Spring semester ,Junior year</b>		
7 - Pre-requisites for this course (if any) : <b>Principles of Electric Machines EE 288)</b> <b>Fundamentals of Electrical Power Systems EE 270</b>		
8 - Co-requisites for this course (if any) : <b>None</b>		
9 - Location if not on main campus : <b>College of Engineering</b>		
10 - Mode of Instruction (mark all that apply)		
A - Traditional classroom	<input checked="" type="checkbox"/> What percentage?	<b>100%</b>
B - Blended (traditional and online)	<input type="checkbox"/> What percentage?	..... %
D - e-learning	<input type="checkbox"/> What percentage?	..... %
E - Correspondence	<input type="checkbox"/> What percentage?	..... %
F - Other	<input type="checkbox"/> What percentage?	..... %
Comments :		
.....		

## B Objectives

<p><b>What is the main purpose for this course?</b></p> <p>The student should be able to :</p> <ol style="list-style-type: none"> <li>1- Be acquainted with the main components of a Power System</li> <li>2- Understand the different methods used to represent and analyze the power system in normal and abnormal (faulty) steady state conditions</li> <li>3- Solve problem of an existing power system</li> <li>4- Think creatively for solving different types of Power System</li> <li>5- Apply skills when dealing with a given power system</li> </ol>
<p><b>Briefly describe any plans for developing and improving the course that are being implemented :</b></p> <ol style="list-style-type: none"> <li>1. Apply modern techniques and tools to carry out Power System Analysis</li> <li>2. Use the help of software's such as Matlab, ETAP etc. to carry out Load Flow studies and Fault Analysis.</li> </ol>





## C. Course Description

### 1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Per Unit system ; Power System Matrices	1	4
Bus Admittance Matrix ; Bus Impedance Matrix	2	8
Load Flow Analysis by Gauss-Seidel Method and Newton- Raphson Method	3	12
Economic Operation of Generators : by neglecting transmission losses and by including transmission losses	2	8
Symmetrical Faults : Thevenin's method and Bus Impedance Matrix method	2	8
Unsymmetrical Faults : Thevenin's and Bus impedance matrix method	3	12
Stability Analysis : steady state stability, transient stability and equal area criterion	2	8

### 2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
<b>Contact Hours</b>	45	15	0	0	0	60
<b>Credit</b>	3	0	0	0	0	3

3. Additional private study/learning hours expected for students per week.

6
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#### 4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
<b>1.0</b>	<b>Knowledge</b>		
<b>1.1</b>			
<b>1.2</b>	.....	.....	.....
<b>1.3</b>	The ability to recall, understand, and present information, including knowledge of specific facts, knowledge of concepts, principles and theories, and knowledge of procedures	Lecture, debate, Small group work, whole group and small group discussion, research activities, lab demonstrations, projects, debates, role playing, case studies, memorization and individual presentation	Standardized exams, Seminars and Assignments
<b>1.4</b>	.....	.....	.....
<b>1.5</b>	.....	.....	.....
<b>1.6</b>	.....	.....	.....
<b>2.0</b>	<b>Cognitive Skills</b>		
<b>2.1</b>			
<b>2.2</b>	An ability to design a system, component, or process to meet desired needs within realistic constraints	Lecture, small group work, , research activities, lab demonstrations, projects and individual presentation	Reports and presentations
<b>2.3</b>	An ability to identify, formulate, and solve engineering problems	Lecture, small group work, , research activities, lab demonstrations, projects and individual	Standardized exams, oral exams, micro projects





	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
2.4	The ability to analyze, design, and implement systems.	presentation Lecture, small group work, research activities, lab demonstrations, projects and individual presentation	Standardized exams, oral exams, micro projects
2.5	.....	.....	.....
2.6	.....	.....	.....
<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1	.....	.....	.....
3.2	.....	.....	.....
3.3	.....	.....	.....
3.4	.....	.....	.....
3.5	.....	.....	.....
3.6	.....	.....	.....
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
4.1	An ability to apply knowledge of mathematics, science, and engineering	Lecture, research activities, lab demonstrations, projects, case studies, memorization and individual presentation	Standardized exams, oral exams, micro projects
4.2	.....	.....	.....
4.3	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	Lecture, research activities, lab demonstrations, projects, case studies, memorization and individual presentation	Exams, quizzes and reports
4.4	.....	.....	.....
4.5	.....	.....	.....
4.6	.....	.....	.....
<b>5.0</b>	<b>Psychomotor</b>		
5.1	.....	.....	.....





	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
5.2	.....	.....	.....
5.3	.....	.....	.....
5.4	.....	.....	.....
5.5	.....	.....	.....
5.6	.....	.....	.....

**5. Schedule of Assessment Tasks for Students During the Semester:**

	Assessment task	Week Due	Proportion of Total Assessment
1	First Mid-Term	6	20%
2	Second Mid-Term	12	20%
3	Final Exam	15	40%
4	Micro-Project	7	10%
5	Quiz	11	10%
6	.....	.....	.....
7	.....	.....	.....
8	.....	.....	.....





## D. Student Academic Counseling and Support

1. Three office hours for supporting the student academic counselling.
2. All students are distributed among academic advisors
3. Advising information are included in the student Guide and in the College website

## E. Learning Resources

### 1. List Required Textbooks :

- Saadat, " Power System Analysis", McGraw Hill, 2nd edition

### 2. List Essential References Materials :

### 3. List Recommended Textbooks and Reference Material :

- Grainger and Stevenson, "Power System Analysis", McGraw Hill
- Glover and Sarma, "Power System Analysis and Design", PWS, 3rd edition
- D P Kothari and I J Nagrath, "Modern Power System Analysis", Mc Graw Hill, 3rd edition

### 4. List Electronic Materials :

- [www.nptel.ac.in](http://www.nptel.ac.in),....
- [www.faculty.mu.edu.sa/praveen.r](http://www.faculty.mu.edu.sa/praveen.r)
- .....

### 5. Other learning material :

- .....
- .....
- .....

## F. Facilities Required

### 1. Accommodation

- Laboratory Available
- Lecture room Available .
- .....

### 2. Computing resources

- LCD Projector Available
- Smart Board Available

### 3. Other resources

## G Course Evaluation and Improvement Processes

### 1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:





- Completion course evaluation questionnaire,
- Classroom observations to measure student behavior through how well the student groups are interacting in-class activity and how well the in-class activity went.

## **2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :**

### **3 Processes for Improvement of Teaching :**

1. Plan: The instructor will develop a strategy for teaching.
2. Do: The strategy will be implemented for one semester.
3. Study: The experiences of the students will be collected through a survey.
4. Act: Effective teaching strategies will be implemented and revised as more experiences are gained.

### **4. Processes for Verifying Standards of Student Achievement**

Check marking of a sample of examination papers.

### **5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :**

Continuous improvement is a circular process, encompassing student assessment, course planning and design, implementation, evaluation, and revision.

- A feedback from all relevant assessment tools must be considered in the continuous process of course objectives refinement and assessment.
- Continuous process for reviewing feedback from student on the quality of the course and planning for improvement.

## **Course Specification Approved**

**Department Official Meeting No ( ..... ) Date ... / .... / ..... H**

### **Course's Coordinator**

**Name :** Dr. Praveen R.P.  
**Signature :** .....  
**Date :** 25/ 3 /1437 H

### **Department Head**

**Name :** Dr Abdullah Almuhasien  
**Signature :** .....  
**Date :** .../ ... / ..... H

