

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING  
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN –PART I			
Name of the programme and specialization	III Year B.Tech, EEE		
Course Title	POWER SYSTEM ANALYSIS		
Course Code	EEPC25	No. of Credits	04
Course Code of Pre-requisite subject(s)	MAIR42	EEPC16	
Session	July 2019	Section	A
Name of Faculty	M. Jaya Bharata Reddy	Department	EEE
Email	jbreddy@nitt.edu	Telephone No.	0431-2503270
Pre-requisites Course Code	Knowledge on the electrical transmission and distribution, besides numerical methods to solves electrical problems.		
Course Coordinator(s) (if, applicable)	---		
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		
<b>Syllabus (approved in BoS)</b>			
<p><b>Modeling of power system components</b> – single line diagram – per unit quantities– bus impedance and admittance matrix.</p> <p><b>Power flow analysis methods</b> – Gauss-Seidel, Newton-Raphson and Fast decoupled methods of load flow analysis.</p> <p><b>Fault studies – Symmetrical fault analysis</b>, Analysis through impedance matrix, Current limiting reactors.</p> <p><b>Fault analysis - Unsymmetrical short circuit analysis</b> - LG, LL, LLG; Fault parameter calculations – Open circuit faults.</p> <p><b>Stability studies</b> – Steady state and transient stability– Swing equation - Equal area criterion – multi-machine stability analysis.</p>			
<b>COURSE OBJECTIVES</b>			
The aim of this course to model various power system components and carry out load flow, short-circuit and stability studies			

Course Outcomes	Aligned Programme Outcomes (PO)				
At the end of the course students will  1. Carry out load flow study of a practical system.  2. Simulate and analyze fault.  3. Study the stability of power systems.	COs / POs	Course outcomes(COs)			
		1	2	3	
	Programme Outcomes (POs)	1	H	H	H
		2	H	H	H
		3	NA	NA	NA
		4	NA	NA	NA
		5	H	H	H
		6	NA	NA	NA
		7	M	M	M
		8	H	H	H
		9	H	H	H
		10	H	H	H
		11	M	M	M
		12	H	H	H
13		M	M	M	
14	M	M	M		

COURSE PLAN –PART II			
COURSE OVERVIEW			
Students are exposed to model the various power system components and analyze the performance of the power system under different power system disturbances.			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week	Topic	Mode of Delivery
1	Weeks 1 to 3 (12 contact hours, including four contact hours for problem solving)	Modelling of power system components.	Lecture/Tutorial
2		Numerical examples/Problem solving	Group work (exercise)
3	Weeks 4 to 6 (12 contact hours, including five contact hours for problem solving and one hour for 1 <sup>st</sup> mid exam)	Power flow analysis methods	Lecture/Tutorial
4		Numerical examples/Problem solving	Group work (exercise)
		<b>Assessment 1</b>	Written test
5	Weeks 7 to 9 (12 contact hours, including four contact hours for problem solving)	Fault studies (Symmetrical fault analysis)	Lecture/Tutorial
6		Numerical examples/Problem solving	Group work (exercise)
7	Weeks 10 to 11 (12 contact hours, including four contact hours for problem solving)	Fault analysis (Unsymmetrical fault analysis)	Lecture/Tutorial
8		Numerical examples/Problem solving	Group work (exercise)
9	Week 12 (2 <sup>nd</sup> mid-exam)	<b>Assessment 1</b>	Written test
10	Weeks 13 to 15 (12 contact hours, including four contact hours for problem solving)	Stability studies	Lecture/Tutorial
		Numerical examples/Problem solving	Group work (exercise)
11		<b>Compensation Assessment (CPA)</b>	Written test
		<b>End Semester Examination</b>	Written test

Mode of Assessment				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	1 <sup>st</sup> Mid Semester Examination (Written test) (1 <sup>st</sup> and 2 <sup>nd</sup> Units)	6 <sup>th</sup> Week	60 Minutes	20
2	2 <sup>nd</sup> Mid Semester Examination (Written test) (3 <sup>rd</sup> and 4 <sup>th</sup> Units)	12 <sup>th</sup> Week	60 Minutes	20
3	Take Home / Team Task	3 <sup>rd</sup> to 13 <sup>th</sup> week	Work will be carried out along with the course	10
4	End Semester Examination (Written test)	15 <sup>th</sup> week	180 Minutes	50

#### **ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals etc**

1. John .J. Grainger & Stevenson. W. D., 'Power System Analysis', McGraw Hill, 1 st Edition, 2003.
2. D P Kothari, I J Nagrath 'Modern Power System Analysis', 3rd Edition, 2011.
3. Hadi Saadat, 'Power System Analysis ', Tata McGraw-Hill Education, 2nd Edition, 2002.
4. J. Duncan Glover, M.S.Sarma & Thomas J. Overbye, 'Power System Analysis and Design', Cengage Learning, 5 th Edition, 2011.
5. J.C.Das, 'Power System Analysis, 'Short-Circuit Load Flow and Harmonics', Marcel Dekker Inc., 1 st Edition, 2002.
6. Arthur R. Bergen, 'Power System Analysis', Pearson Education India, 2nd Edition, 2009.
7. Gupta B.R., 'Power system Analysis & Design', S.Chand and Company Ltd., 5th Edition, 2001

#### **COURSE EXIT SURVEY**

Feedback from the students during class committee meetings

#### **COURSE POLICY**

##### **MODE OF CORRESPONDENCE (email/ phone etc)**

1. All the students are advised to check their NITT WEBMAIL regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be done through their webmail.

##### **COMPENSATION ASSESSMENT POLICY**

1. If any student is not able to attend I and / or II Cycle test(s) due to genuine reasons, student is permitted to attend the compensation assessment (CPA) with 20% weightage (20 marks).

##### **ATTENDANCE POLICY**

- **At least 75% attendance in each course is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**
- **Students with less than 65% of attendance shall be prevented from writing the final**

assessment and shall be awarded 'V' grade.

**ACADEMIC HONESTY & PLAGIARISM**

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

The above policy against academic dishonesty shall be applicable for all the programmes.

**ADDITIONAL INFORMATION: ---**

**FOR APPROVAL**

Course Faculty \_\_\_\_\_

CC-Chairperson \_\_\_\_\_

*S. Mageshwar*  
HoD

*S. Sundhy*