NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	**B.TECH. ELECTRICAL AND ELECTRONICS ENGINEERING**		
Course Title	**POWER SYSTEM ANALYSIS**		
Course Code	**EEPC**	**No. of Credits**	**4**
Course Code of Pre-requisite subject(s)			
Session	**July**	**Section (if, applicable)**	**A**
Name of Faculty	**S ARUL DANIEL**	**Department**	**EEE**
Official Email	**DANIEL@NITT.EDU**	**Telephone No.**	
Name of Course Coordinator(s) (if, applicable)			
Official E-mail		**Telephone No.**	
Course Type (please tick appropriately)	☐ **Core course**	☐ **Elective course**	

Syllabus (approved in BoS)

Course Content : Modeling of power system components – single line diagram – per unit quantities– bus impedance and admittance matrix.
Power flow analysis methods – Gauss-Seidel, Newton-Raphson and Fast decoupled methods of load flow analysis.
Fault studies – Symmetrical fault analysis, Analysis through impedance matrix, Current limiting reactors.
Fault analysis - Unsymmetrical short circuit analysis - LG, LL, LLG; Fault parameter calculations – Open circuit faults.
Stability studies – Steady state and transient stability– Swing equation - Equal area criterion – multimachine stability analysis.

COURSE OBJECTIVES

To model various power system components and carry out load flow, short-circuit and stability studies.

MAPPING OF COs with POs

Upon completion of the course, the student will be able to

1. Carry out load flow study of a practical system – 1,5
2. Simulate and analyze fault. – 1,5
3. Study the stability of power systems. – 1,5

COURSE PLAN – PART II			
COURSE OVERVIEW			
Power systems is the geographically spread large system that mankind had ever devised. Nation's growth is dependent on its per-capita energy consumption and hence development of power systems is significant. In order to plan for expansion due to the ever increasing consumption of electricity and to operate the system at its best performance, certain studies are essential. This course will give the rudiments of modelling a power system and to use the model in system studies.			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	**Week/Contact Hours**	**Topic**	**Mode of Delivery**
1.	**1 and 2**	**Introduction, one line diagram and per-unit representation of transformers and synchronous machines**	**Lecture and Tutorial**
2.	**3**	**Y bus formation**	**Lecture and Tutorial**
4.	**4**	**Static load flow equations, Gauss Seidel method**	**Lecture, Tutorial and Simulation**
5.	**5 and 6**	**NR method and decoupled load flows**	**Lecture, Tutorial and Simulation**
6.	**7 to 9**	**Z bus formation and equivalent circuits. Three-phase short circuit studies.**	**Lecture and Tutorial**
7.	**10**	**Symmetrical components and symmetrical networks**	**Lecture and Tutorial**
8.	**11 and 12**	**Line to Ground, Line to Line and double line to ground fault studies**	**Lecture, Tutorial and Simulation**
		Open circuit faults	
9.	**13**	**Stability studies**	**Lecture and Tutorial**
10	**14 and 15**	**Group Task Assessment**	**Lecture and Tutorial**
11.	**16**		

COURSE ASSESSMENT METHODS (shall range from 4 to 6**)**

S.No.	Assessment	Week/Date	Mode	% Weightage
1	Summative Assessment 1	End of 6th week	written	20%

2	Summative Assessment 2	End of 12th week	written	20%
3	Mini project/research	14th week	Practical/Write up	20%
4	Seminar	15th week	Presentation	10%
5	Final Assessment	16th week	written	30%

***mandatory; refer to guidelines on page 4**

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

At the end of the course

COURSE POLICY (including compensation assessment to be specified**)**

One compensation assessment for item 4 above.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- 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 DISHONESTY & 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, IF ANY

FOR APPROVAL

Course Faculty _____ **CC- Chairperson** _____ **HOD** _____

Guidelines

a) The number of assessments for any theory course shall range from 4 to 6.

b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.

c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.

d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.

f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.

g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.