



COURSE PLAN – PART I			
Name of the Programme and Specialization	M.Tech. – Power Systems		
Course Title	POWER SYSTEMS LABORATORY		
Course Code	EE608	No. of Credits	02
Course Code of Pre-requisite subject(s)	-		
Session	JANUARY 2022	Section (if, applicable)	NA
Name of Faculty	Dr. S. Kayalvizhi	Department	EEE
Email	<a href="mailto:kayalvizhi@nitt.edu">kayalvizhi@nitt.edu</a>	Telephone No.	9790050752
Name of Course Coordinator(s) (if, applicable)	-		
Course Type	<input checked="" type="checkbox"/> Core course	<input type="checkbox"/> Elective course	
<b>List of experiments</b>			
<ol style="list-style-type: none"><li>1. YBUS Formation</li><li>2. ZBUS Formation</li><li>3. Load Flow analysis (Newton Raphson)</li><li>4. Short Circuit Analysis</li><li>5. Un-symmetrical fault analysis</li><li>6. Economic Load Dispatch using Genetic Algorithm (GA)</li><li>7. Power Quality improvement using FACTS devices</li><li>8. ABCD parameter determination</li><li>9. Transmission line performance analysis</li><li>10. HVDC system analysis</li><li>11. Modelling of PV and Maximum Power point tracking of PV</li><li>12. Load forecasting</li><li>13. Demonstration of SVC/STATCOM</li><li>14. Demonstration of Numerical Relay</li><li>15. Demonstration of Complete Protection Analysis</li></ol>			
<b>COURSE OBJECTIVES</b>			
<ul style="list-style-type: none"><li>• To understand and analyzing different concepts of the power system which includes generation, transmission and distribution along with control and protection.</li><li>• To explore various system studies made in real time power system in the post graduate level.</li></ul>			



<b>COURSE OUTCOMES (CO)</b>			
<b>Course Outcomes</b>			<b>Aligned Programme Outcomes (PO)</b>
Upon completion of the course the students would be able to			
1. Practical understanding of different types of electro mechanical and numerical relays.			<b>1 - 14</b>
2. Practical understanding about transmission line fault analysis, power flow and different types of compensations on transmission lines.			<b>1 - 14</b>
3. Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner.			<b>1 - 14</b>
<b>COURSE PLAN – PART II</b>			
<b>COURSE OVERVIEW</b>			
<p>Electrical power system operates at various voltage levels from 415 V to 400 kV or even more. Electrical apparatus used may be enclosed (e.g., motors) or placed in open (e.g., transmission lines). All such equipment undergoes abnormalities in their life time due to various reasons.</p> <p>It becomes mandatory for every power engineer to get familiarized with the basic concepts of power systems even before they get placed in field. Hence this course is planned such that to enhance the practical understanding of the power system concepts.</p>			
<b>COURSE TEACHING AND LEARNING ACTIVITIES</b>			
<b>S.No.</b>	<b>Week/Contact Hours</b>	<b>Topic</b>	<b>Mode of Delivery</b>
1	Week 1 19 <sup>th</sup> - 21 <sup>st</sup> Jan 2022	Introduction to the course	Lecture C&T through MS Teams
2	Week 2 24 <sup>th</sup> - 28 <sup>th</sup> Jan 2022	YBUS Formation	Experimentation by simulation through MS Teams
3	Week 3 31 <sup>st</sup> Jan - 4 <sup>th</sup> Feb 2022	Load Flow analysis (Newton Raphson)	Experimentation by simulation through MS Teams
4	Week 4 7 <sup>th</sup> - 11 <sup>th</sup> Feb 2022	Economic Load Dispatch using Genetic Algorithm (GA)	Experimentation by simulation through MS Teams
5	Week 5 14 <sup>th</sup> - 18 <sup>th</sup> Feb 2022	ZBUS Formation	Experimentation by simulation through MS Teams
6	Week 6 21 <sup>st</sup> – 25 <sup>th</sup> Feb 2022	Short Circuit Analysis	Experimentation by simulation through MS Teams
7	Week 7 28 <sup>th</sup> Feb - 4 <sup>th</sup> Mar 2022	Un-symmetrical fault analysis	Experimentation by simulation through MS Teams



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8	Week 8 7 <sup>th</sup> - 11 <sup>th</sup> Mar 2022	Power Quality improvement using FACTS devices	Experimentation by simulation through MS Teams
9	Week 9 14 <sup>th</sup> - 17 <sup>th</sup> Mar 2022	ABCD parameter determination & Transmission line performance analysis	Experimentation by simulation through MS Teams
10	Week 10 21 <sup>st</sup> & 22 <sup>nd</sup> Mar 2022	HVDC System Analysis	Experimentation by simulation through MS Teams
11	Week 11 28 <sup>th</sup> Mar - 1 <sup>st</sup> April 2022	Modelling of PV and Maximum Power point tracking of PV	Experimentation by simulation through MS Teams
12	Week 12 4 <sup>th</sup> - 8 <sup>th</sup> April 2022	Load forecasting	Experimentation by simulation through MS Teams
13	Week 13 11 <sup>th</sup> - 15 <sup>th</sup> April 2022	Demonstration experiments	Experimentation by simulation through MS Teams
14	Week 14 18 <sup>th</sup> - 22 <sup>nd</sup> April 2022	Assessment – III Mini – project	Experimentation by simulation through MS Teams
15	Week 15 25 <sup>th</sup> - 29 <sup>th</sup> April 2022	Assessment – III Mini – project	Demonstration by students through MS Teams
16	Week 16 2 <sup>nd</sup> -6 <sup>th</sup> May 2022	ASSESSMENT - IV	Final assessment through MS Teams

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

S. No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Continuous Assessment and report submission	Throughout the semester	Two sessions of 3 hours each in a week	40
2	Quiz – Lab Experiments	Throughout the semester	---	10
3	Mini – project	Week 14 & 15 18 <sup>th</sup> – 29 <sup>th</sup> April 2022	---	20
4	Compensation Assessment	Week 15 25 <sup>th</sup> - 29 <sup>th</sup> April 2022	Missed lab sessions and continuous assessments can be evaluated ( on Genuine ground)	
5	Final examination	Week 16 18 <sup>th</sup> - 22 <sup>nd</sup> April 2022	---	30



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

- Feedback from the students during class committee meetings
- Anonymous feedback through questionnaire (Mid of the semester & End of the semester) end semester feedback on Course Outcomes

**COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, academic honesty and plagiarism etc.)**

**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 only.
2. Queries (if required) to the course teacher shall only be emailed to [Kayalvizhi@nitt.edu](mailto:Kayalvizhi@nitt.edu)

**ATTENDANCE**

- 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.

**COMPENSATION ASSESSMENT**

1. Attending all the assessments is **MANDATORY** for every student.
2. One Compensation Assessment (CPA) will be conducted for those students who are being physically absent for the continuous assessment and mini-project.
3. At any case, CPA will not be considered as an improvement test.
4. Relative grading will be adopted for the course.

**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.



**ADDITIONAL INFORMATION**

The faculty is available for consultation at times as per the intimation given by the faculty.

Queries may also be emailed to the Course Coordinator directly at [Kayalvizhi@nitt.edu](mailto:Kayalvizhi@nitt.edu)

**FOR APPROVAL**

Course Faculty

[Dr. S. Kayalvizhi]

CC-Chairperson

[Dr. Pinkymol K P]

HOD / EEE

[Dr. V. SANKARANARAYANAN]