

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

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech and Electrical and Electronics Engineering		
Course Title	TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY		
Course Code	EEPC17	No. of Credits	4
Course Code of Pre-requisite subject(s)	EEPC10		
Session	January- 2022	Section (if, applicable)	B
Name of Faculty	Dr. Sishaj P Simon	Department	Electrical and Electronics Engineering
Email	sishajpsimon@gmail.com	Telephone No.	0431-2503265
Name of Course Coordinator(s) (if, applicable)			
E-mail		Telephone No.	
Course Type	<input checked="" type="checkbox"/> Core course	<input type="checkbox"/> Elective course	
Syllabus (approved in BoS)			
<p>Transmission line parameters – Resistance, Inductance, and Capacitance calculations – Single-phase and three-phase lines – double circuit lines – effect of earth on transmission line capacitance.</p> <p>Performance of transmission lines – Regulation and efficiency – Tuned power lines, Power flow through a transmission line – Power circle diagrams, Introduction to Transmission loss and Formation of corona – critical voltages – effect on line performance – travelling waveform phenomena.</p> <p>Mechanical design of overhead lines – Line supports – Insulators, Voltage distribution in suspension insulators – Testing of insulators – string efficiency – Stress and sag calculation – effects of wind and ice loading.</p> <p>Underground cables – Comparison with overhead line – Types of cables – insulation resistance – potential gradient – capacitance of single-core and three-core cables.</p> <p>Distribution systems – General aspects – Kelvin's Law – A.C. distribution – Single-phase and three phase – Techniques of voltage control and power factor improvement – Introduction to Distribution loss – Recent trends in transmission and distribution systems.</p> <p>Text Books</p> <ol style="list-style-type: none"> 1. D.P.Kothari and I.J. Nagrath, 'Power System Engineering', Tata McGraw-Hill, 2nd Edition, 2008. 2. Gupta B.R, 'Power System Analysis & Design', S.Chand and Company Ltd., 5th Edition, 2001. 3. John J. Grainger & Stevenson. W. D., 'Power System Analysis', McGraw-Hill, 1st Edition, 2003. <p>Reference Books</p>			

1. Vincent Del Toro, 'Electrical Engineering Fundamental', Prentice Hall India, 2002.
1. Turan Gonen, 'Electric Power Distribution System Engineering', CRC Press INC, 2nd Edition 2007.
2. 'Electrical Transmission and Distribution Reference Book', Westinghouse Electric Corporation, 4th Edition 2007.

COURSE OBJECTIVES(CB)

- Identify major components of power transmission and distribution systems.
- Describe the principle of operation of transmission and distribution equipment.
- Know and appreciate the key factors in transmission and distribution system equipment specification and network design.

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)																												
Upon completion of the course, the student will 1. Understand the major components of Transmission and Distribution Systems (TDS) and its practical significance.	<table border="1"> <thead> <tr> <th>PO1</th> <th>PO2</th> <th>PO3</th> <th>PO4</th> <th>PO5</th> <th>PO6</th> <th>PO7</th> </tr> </thead> <tbody> <tr> <td>H</td> <td>H</td> <td>M</td> <td>M</td> <td>H</td> <td>M</td> <td>M</td> </tr> <tr> <th>PO8</th> <th>PO9</th> <th>PO10</th> <th>PO11</th> <th>PO12</th> <th>PO13</th> <th>PO14</th> </tr> <tr> <td>M</td> <td>H</td> <td>H</td> <td>M</td> <td>H</td> <td>M</td> <td>M</td> </tr> </tbody> </table>	PO1	PO2	PO3	PO4	PO5	PO6	PO7	H	H	M	M	H	M	M	PO8	PO9	PO10	PO11	PO12	PO13	PO14	M	H	H	M	H	M	M
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PO8	PO9	PO10	PO11	PO12	PO13	PO14																							
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2. Have good Knowledge of various equipment specifications and design for TDS.	<table border="1"> <thead> <tr> <th>PO1</th> <th>PO2</th> <th>PO3</th> <th>PO4</th> <th>PO5</th> <th>PO6</th> <th>PO7</th> </tr> </thead> <tbody> <tr> <td>H</td> <td>H</td> <td>M</td> <td>M</td> <td>H</td> <td>M</td> <td>M</td> </tr> <tr> <th>PO8</th> <th>PO9</th> <th>PO10</th> <th>PO11</th> <th>PO12</th> <th>PO13</th> <th>PO14</th> </tr> <tr> <td>M</td> <td>H</td> <td>H</td> <td>M</td> <td>H</td> <td>M</td> <td>M</td> </tr> </tbody> </table>	PO1	PO2	PO3	PO4	PO5	PO6	PO7	H	H	M	M	H	M	M	PO8	PO9	PO10	PO11	PO12	PO13	PO14	M	H	H	M	H	M	M
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3. Have awareness of latest technologies in the field of electrical transmission and distribution.	<table border="1"> <thead> <tr> <th>PO1</th> <th>PO2</th> <th>PO3</th> <th>PO4</th> <th>PO5</th> <th>PO6</th> <th>PO7</th> </tr> </thead> <tbody> <tr> <td>H</td> <td>H</td> <td>M</td> <td>M</td> <td>H</td> <td>M</td> <td>M</td> </tr> <tr> <th>PO8</th> <th>PO9</th> <th>PO10</th> <th>PO11</th> <th>PO12</th> <th>PO13</th> <th>PO14</th> </tr> <tr> <td>M</td> <td>H</td> <td>H</td> <td>M</td> <td>H</td> <td>M</td> <td>M</td> </tr> </tbody> </table>	PO1	PO2	PO3	PO4	PO5	PO6	PO7	H	H	M	M	H	M	M	PO8	PO9	PO10	PO11	PO12	PO13	PO14	M	H	H	M	H	M	M
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COURSE PLAN – PART II

COURSE OVERVIEW

Students get exposure on transmission and distribution system. They will be able to estimate the transmission line parameters and analyze the performance of the transmission lines. They will be able to design the electrical transmission network. They will learn the electrical distribution system.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week-1 (28 th , 29 th , 30 th , 31 st -Dec-21)	Transmission line parameters, Resistance, Inductance, and Capacitance calculations	Lecture/ PPT or any suitable
2	Week-2 (4 th , 5 th , 6 th , 7 th -Jan-22)	Single-phase and three-phase lines – double circuit lines	Lecture/ PPT or any suitable
3	Week-3 (11 th , 12 th , 13 th -Jan-22)	effect of the earth on transmission line capacitance. DC & AC-Assignment-1	Lecture/ PPT or any suitable
4	Week-4 (18 th , 19 th , 20 th , 21 st -Jan-22)	Performance of transmission lines – Regulation and efficiency Tuned power lines	Lecture/ PPT or any suitable
5	Week-5 (25 th , 27 th , 28 th -Jan-22)	Power flow through a transmission line – Power circle diagrams,	Lecture/ PPT or any suitable

6	Week-6 (1 st ,2 nd ,3 rd ,4 th -Feb-22)	Introduction to Transmission loss and Formation of corona, critical voltages, effect on line performance, travelling waveform phenomena. Assignment-2-	Lecture/ PPT or any suitable
7	Week-7 (8 th ,9 th ,10 th , 11 th - Feb -22)	Mechanical design of overhead lines, Line supports Insulators-1 st Assessment	Lecture/ PPT or any suitable
8	Week-8 (15 th ,16 th ,17 th , 18 th - Feb -22)	Voltage distribution in suspension insulators, Testing of insulators – string efficiency –Stress and sag calculation – effects of wind and ice loading- Assignment-3	Lecture/ PPT or any suitable
9	Week-9 (22 nd ,23 rd - Feb -22)	Underground cables – Comparison with overhead line-Types of cables	Lecture/ PPT or any suitable
10	Week-10 (1 st ,2 nd ,3 rd ,4 th ,-Mar-22)	insulation resistance –potential gradient – capacitance of single-core and three-core cables- Assignment-4, 2nd Assessment	Lecture/ PPT or any suitable
11	Week-11 (8 th ,9 th ,10 th ,11 th ,-Mar-22)	Distribution systems – General aspects – Kelvin's Law	Lecture/ PPT or any suitable
12	Week-12 (15 th ,16 th ,17 th - Mar-22)	A.C. distribution – Single-phase and three-phase	Lecture/ PPT or any suitable
13	Week-13 (22 nd ,23 rd ,24 th , 25 th -Mar-22)	Techniques of voltage control and power factor improvement	Lecture/ PPT or any suitable
14	Week-14 (29 th ,30 th ,31 st - Mar 22, 1 st - April 22)	Recent trends in transmission systems	Lecture/ PPT or any suitable
15	Week-15 (5 th ,6 th ,7 th ,8 th ,- April -22)	Recent trends in distribution systems- Assignment-5, Compensation Assessment	Lecture/ PPT or any suitable

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S. No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	1 st Assessment (1 st and 2 nd Units)	6 th Week (8 th - Feb -22)	75 Minutes	25
2	2 nd Assessment (3 rd and 4 th Units)	10 th Week (2 nd -Mar-22)	75 Minutes	25
3	3 rd Assessment-Assignments (1 st unit to 5 th unit)	3 rd to 15 th Week	Home Work	10
4	Compensation Assessment (1 st unit to 4 th unit)	15 th Week (8 th - April -22)	75 Minutes	25
5	Final Assessment (1 st to 5 th unit)	17 th Week	120 minutes	40

* Attending all the assessments (Assessment 1-3 and 5) are MANDATORY for every student.

COURSE EXIT SURVEY

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

COURSE POLICY

MODE OF CORRESPONDENCE

1. All the students are advised to check their NITT WEBMAIL or group email id (if any) regularly. All the correspondence (schedule of classes/schedule of assessment/course material/any other information regarding this course) will be done through email only.
2. Queries if any can be emailed to the course teacher sishajpsimon@gmail.com

COMPENSATION ASSESSMENT POLICY

1. If any student is not able to attend 1st Assessment / 2nd Assessment due to genuine reason, student is permitted to attend the Compensation Assessment with 25% weightage (25 marks).
2. In any case, compensation test will not be considered as an improvement test.

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

- Be aware of the B. Tech regulations in the institute website for passing minimum, redo, formative assessment, grades, credits etc.

FOR APPROVAL

Course Faculty

SPD
4/11/2022

CC-Chairperson

Home
Amesha Fashion

HOD

gch
05/01/2022
(i/c)