



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	Transmission and Distribution of Electrical Energy		
Course Code	EEPC17	No. of Credits	4
Course Code of Pre/ Co-requisite subject(s)	EEPC10		
Session	January 2021	Section (if, applicable)	A
Name of Faculty	Dr. M. P. SELVAN	Department	EEE
Email	selvanmp@nitt.edu	Telephone No.	9444170638
Name of Course Coordinator(s) (if, applicable)			NA
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, 2ndEdition, 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> <ol style="list-style-type: none"> 1. Turan Gonen, 'Electric Power Distribution System Engineering', CRC Press INC, 2ndEdition 2007. 2. 'Electrical Transmission and Distribution Reference Book', Westinghouse Electric Corporation, 4thEdition 2007. 			



COURSE OBJECTIVES

1. Identify major components of power transmission and distribution systems.
2. Describe the principle of operation of transmission and distribution equipment.
3. 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 students will	
1. Understand the major components of Transmission and Distribution Systems (TDS) and its practical significance.	1, 2, 5, 8, 12, 13
2. Have good knowledge of various equipment specifications and design for TDS.	1, 2, 5, 8, 12, 13
3. Have awareness of latest technologies in the field of electrical transmission and distribution.	1, 2, 5, 8, 12, 13

COURSE PLAN – PART II

COURSE OVERVIEW

Students learn about electric power generation and the electrical machineries used in power generation through courses such as DC Machines and Transformers and AC Machines. This course describes the process of transmitting the electrical power generated from different generation stations to the load centers and distributing it to the consumers. The electrical equivalent circuit of the transmission and distribution lines will be taught in this course. This equivalent circuit modelling will help students to understand the behaviour of power system network under different scenarios. The use of insulating material in overhead line and underground cable systems for power distribution will also be discussed in this course. Further, students will be exposed to latest technologies in the field of transmission and distribution of electrical energy.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week 1 18-01-2021 to 22-01-2021 (3 Contact Hours)	Introduction to the Course, Course plan details. Transmission line parameters, Resistance and Inductance calculations	Online MS Teams
2	Week 2 25-01-2021 to 29-01-2021 (4 Contact Hours)	Inductance calculations, Capacitance Calculations	Online MS Teams
3	Week 3 01-02-2021 to 05-02-2021 (4 Contact Hours)	Single-phase and three-phase lines, double circuit lines, effect of earth on transmission line capacitance.	Online MS Teams



NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

4	Week 4 08-02-2021 to 12-02-2021 (4 Contact Hours)	Performance of transmission lines, Regulation and efficiency, Tuned power lines	Online MS Teams
5	Week 5 15-02-2021 to 19-02-2021 (4 Contact Hours)	Power flow through a transmission line, Power circle diagrams, Introduction to Transmission loss.	Online MS Teams
6	Week 6 22-02-2021 to 26-02-2021 (1 Contact Hour)	Assessment-1	Online MS Teams
7	Week 7 01-03-2021 to 05-03-2021 (4 Contact Hours)	Formation of corona critical voltages, effect on line performance Travelling waveform phenomena	Online MS Teams
8	Week 8 08-03-2021 to 12-03-2021 (4 Contact Hours)	Mechanical design of overhead lines, Line supports, Insulators, Voltage distribution in suspension insulators, String efficiency	Online MS Teams
9	Week 9 15-03-2021 to 19-03-2021 (4 Contact Hours)	Testing of insulators, Stress and sag calculation, Effects of wind and ice loading, Underground cables, Comparison with overhead line, Types of cables	Online MS Teams
10	Week 10 22-03-2021 to 26-03-2021 (1 Contact Hour)	Assessment – 2	Online MS Teams
11	Week 11 29-03-2021 to 02-04-2021 (3 Contact Hours)	Insulation resistance, potential gradient, capacitance of single-core and three-core cables	Online MS Teams
12	Week 12 05-04-2021 to 09-04-2021 (4 Contact Hours)	Distribution systems, General aspects, Kelvin's Law	Online MS Teams
13	Week 13 12-04-2021 to 16-04-2021 (4 Contact Hours)	A.C. distribution – Single-phase and three phase – Techniques of voltage control and power factor improvement	Online MS Teams
14	Week 14 19-04-2021 to 23-04-2021 (4 Contact Hours)	Introduction to Distribution loss, Recent trends in transmission and distribution systems	Online MS Teams
15	Week 15 26-04-2021 to 30-04-2021 (4 Contact Hours)	Assessment 3 (Group Task)	Online
16	Week 16 03-05-2021 to 07-05-2021 (1 Contact Hour)	Compensation Assessment	Online
17	Week 17 10-05-2021 to 14-05-2021 (2 Contact Hours)	Final Assessment	Online



COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week	Duration	% Weightage
1	Surprize Quiz			5
	Scheduled Quiz	Week 6	60 Minutes	20
2	Surprize Quiz			5
	Scheduled Quiz	Week 10	60 Minutes	20
3	Group Task/ Take Away Tasks	Week 15		20
CPA	Compensation Assessment	Week 16	60 Minutes	20
4	Final Assessment	Week 17	90 Minutes	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

Institute end semester feedback

COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)

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/ any other information regarding this course) will be done through their Webmail only. Conduct of course and sharing of course material will be done through MS Teams. Suitable platform/software tool will be chosen for the conduct of assessments and will be informed to the students.
2. Queries (if required) to the course teacher shall only be emailed to selvanmp@nitt.edu.

COMPENSATION ASSESSMENT POLICY

1. Attending all the assessments are MANDATORY for every student.
2. If any student is not able to attend any of the assessments (1 and 2, scheduled quizzes only) due to genuine reason, student is permitted to attend the compensation assessment (CPA).
3. At any case, CPA will not be considered as an improvement test.



ATTENDANCE POLICY

As directed by the Academic Office.

ACADEMIC DISHONESTY & PLAGIARISM

- Copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark will 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.

FOR APPROVAL

Course Faculty

CC-Chairperson

Approved by mail

HOD