

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Course Title	TRANSMISSION AND DISTRIBUTION OF ELECTRICAL ENERGY		
Course Code	EEPC16	No. of Credits	3
Course Code of Pre-requisite subject(s)	EEPC11		
Session	January 2019	Section (if, applicable)	B
Name of Faculty	Dr. Sishaj P Simon	Department	EEE
Email	sishajpsimon@gmail.com	Telephone No.	0431-2503265
Name of Course Coordinator(s) (if, applicable)	Dr. M P Selvan		
E-mail	selvanmp@nitt.edu	Telephone No.	0431-2503262
Course Type	<input checked="" type="checkbox"/> Core course	<input type="checkbox"/> Elective course	

Syllabus (approved in BoS)

Transmission line parameters – Resistance, Inductance and Capacitance calculations – Single-phase and three-phase lines – double circuit lines – effect of earth on transmission line capacitance.

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.

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.

Underground cables – Comparison with overhead line – Types of cables – insulation resistance – potential gradient – capacitance of single-core and three-core cables.

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.

Text Books:

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.

Reference Books:

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

- 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)

H-High, M=Medium, L=Low

1. Understand the major components of Transmission and Distribution Systems (TDS) and its practical significance.

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

2. Have good Knowledge of various equipment specifications and design for TDS.

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

3. Have awareness of latest technologies in the field of electrical transmission and distribution.

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

COURSE PLAN – PART II

COURSE OVERVIEW

Students get exposure on transmission and distribution system. They will able to estimate the transmission lines parameters and analysis the performance of the transmission lines. They will 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	2 nd week of January (3 contact hours)	Transmission line parameters	Lecture C&T/ PPT or any suitable mode Lecture
2	3 rd week of January (3 contact hours)	Resistance, Inductance and Capacitance calculations for single phase and three phase lines	
3	4 th week of January (3 contact hours)	Resistance, Inductance and Capacitance calculations for double circuit lines	
4	5 th week of January (2 contact hours)	Effect of earth on transmission line capacitance- Assignment 1	
5	1 st week of February (1 contact hours)	Performance of transmission lines - Regulation and efficiency	
6	2 nd week of February (3 contact hours)	Tuned power lines, Power flow through a transmission line – Power circle diagrams, Introduction to Transmission loss	

7	3 rd week of February (2 contact hours)	Formation of corona - Critical voltages – effect on line performance-travelling waveform phenomena - Assignment 2	
8	3 rd week of February (1 contact hour)	Assessment -1	Written exam
9	1 st week of March (1 contact hour)	Mechanical design of overhead lines – Line supports- Insulators	Lecture C&T/ PPT or any suitable mode Lecture
10	2 nd week of March (3 contact hours)	Voltage distribution in suspension insulators – Testing of insulators – string efficiency	
11	3 rd week of March (3 contact hours)	Stress and sag calculation – effects of wind and ice loading - Assignment 3	
12	4 th week of March (3 contact hours)	Underground cables – Comparison with overhead line- Types of cables – insulation resistance –potential gradient-Capacitance of single core and three core cables - Assignment 4	
13	1 st week of April (1 contact hour)	Assessment -2	Written exam
14	1 st week of April (2 contact hour)	Distribution systems – General aspects-Kelvin's Law – A.C distribution – single phase and three phase- Group Tasks	Lecture C&T/ PPT or any suitable mode Lecture
15	2 nd week of April (3 contact hour)	Techniques of voltage control and power factor improvement – Introduction to Distribution loss – Recent trends in transmission and distribution systems- Assignment 5	
19	3 rd week of April (1 contact hour)	Assessment -3	(Consolidation of periodic Assignments and Group Tasks)
19	3 rd week of April (1 contact hour)	Assessment -4 (Compensation)	Written exam
20	1 st week of May (1 contact hour)	Assessment -5 (Final Assessment)	Written exam

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Descriptive type Written exam	3 rd week of February	75 minutes	25
2	Descriptive type Written exam	1 st week of April	75 minutes	25
3	Assignments after completion of each unit- (5 Nos)	Consolidation by 3 rd week of April	-	10
4	Compensation Assessment	3 rd week of April	75 minutes	25
5	Final Assessment	1 st week of May	2 hours	40

COURSE EXIT SURVEY

- Feedback from the students during class committee meetings
- Anonymous feedback through questionnaire

COURSE POLICY

MODE OF CORRESPONDENCE

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 the email id specified by the teacher.

ATTENDANCE

1. At least 75% attendance in each course is mandatory
2. A maximum of 10% shall be allowed under ON Duty (OD) category.
3. Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade

COMPENSATION ASSESSMENT

1. Any student who misses any of the continuous assessments (CAs) for genuine reasons [Assessment 1 or Assessment 2] can appear for CPA.

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.

ADDITIONAL INFORMATION

Criteria of passing minimum will be as per institute norms.

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

FOR APPROVAL

Course Faculty _____

SPG
18/1/2019

CC-Chairperson _____

SPG
21/1/19

HOD _____

S. Sondhe