COURSE HANDOUT

Power System-I (EE-601)

EE-6th SEMESTER

ACADEMIC YEAR (2023-24)

Mr. Bhanu Pratap Singh Jamwal

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Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
EE-601	Power System-I	PCC	4	3	1	0	50	100	150
Faculty Details	bhau.ee@mietjammu.in								

Section-A

Unit 1: D.C & A.C. Distribution systems: Recent advancement in power system, distribution systems-feeder, distribution, service mains, classification of distribution system, various types of D.C. and A.C. distributors, voltage drop calculations.

(08 Hrs)

Unit 2: Overhead AC Transmission Lines Parameters: Types and bundling of conductors, resistance calculations, skin effect, proximity effect, inductance and capacitance of single phase and 3-phase, single circuit and double circuit lines, Performance of transmission lines, representation and performance of short, medium and long transmission lines, A, B, C, D parameters

(10 Hrs)

Unit 3: Insulators for overhead Lines: Ferranti effect, visual and critical disruptive voltage conditions effecting corona, power loss due to corona, practical considerations, materials for insulators, types of insulators, potential distribution over a string of suspension insulators, methods for equalizing the potential.

(10 Hrs)

Section-B

Unit 4: Mechanical design of transmission line: Calculation of sag and tension, equivalent span length and sag, effect of ice and wind loading, conductor vibrations and vibration dampers.

(08 Hrs)

Unit 5: Underground Cables: Construction of cable, insulating materials, types of cables-mass impregnated, oil filled and gas filled cables, electrostatic stresses in a cable, grading of cables, insulation resistance of cables, capacitance of single core and three core cables.

(10 Hrs)

Text Books

S.No.	Name of the Books	Author	Publisher Name	Edition (Pub. yr.)
1	Electric Power System	C. L. Wadhwa	New age International	6th (2018)
2	Electrical Power Distribution System	A.S Pabla	Tata McGraw Hill	5th (2004)
3	Power System Stability and Control	Prabha Kundur	McGraw Hill	2nd (2022)

Reference Books

S.No.	Name of the Books	Author	Publisher Name	Edition (Pub. Yr.)
1	Elements of Power System Analysis	C.W. Stevenson	McGraw Hill	5th (2017)
2	Transmission & distribution of Electric Energy	H. Cotton & H. Barber	Hodder Arnold	3rd (1970)

COURSE PLAN		
Unit-I D.C & A.C. Distribution systems		
S.No	**Topics**	**Recommended Books**
1	Recent advancement in power system	Book 1, Ch.1
2	Distribution systems-feeder, distributors, service mains	Book 1, Ch.1
3	Classification of distribution system	Book 1, Ch.1
4	Various types of D.C. distributors	Book 1, Ch.2
6	Various types of A.C. distributors	Book 1, Ch.2
7	Voltage drop calculations.	Book 1, Ch.2
Unit-II Overhead AC Transmission Lines Parameters		
8	Types and bundling of conductors	Book 1, Ch.2
9	Resistance calculations	Book 1, Ch.2
10	Skin effect, proximity effect,	Book 1, Ch.3
11	Inductance and capacitance of single phase and 3-phase	Book 1, Ch.5
12	Single circuit and double circuit lines	Book 1, Ch.5
13	Performance of transmission lines, representation and performance of short transmission lines	Book 1, Ch.5
14	Representation and performance of medium transmission lines	Book 1, Ch.5
15	Representation and performance of long transmission lines	Book 1, Ch.5
16	A, B, C, D parameters	Book 1, Ch.5
Unit-III Insulators for overhead Lines		
17	Ferranti effect	Book 2, Ch.4
18	Visual and critical disruptive voltage	Book 2, Ch.4
19	Conditions effecting corona	Book 2, Ch.4
20	Power loss due to corona, practical considerations	Book 2, Ch.4
21	Materials for insulators	Book 2, Ch.4
22	Types of insulators	Book 2, Ch.4
23	Potential distribution over a string of suspension insulators	Book 2, Ch.4
24	Methods for equalizing the potential	Book 2, Ch.4
Unit-IV Mechanical design of transmission line		
25	Calculation of sag and tension	Book 2, Ch.5
26	Equivalent span length and sag	Book 2, Ch.5
27	Effect of ice and wind loading	Book 2, Ch.5
28	Conductor vibrations	Book 2, Ch.5
29	Vibration dampers.	Book 2, Ch.5
Unit-V Underground Cables		
30	Construction of cable	Book 2, Ch.6
31	Insulating materials	Book 2, Ch.6
32	Types of cables	Book 2, Ch.6
33	Mass impregnated cables	Book 3, Ch.1
34	Oil filled cables	Book 3, Ch.1
35	Gas filled cables	Book3, Ch. 1
36	Electrostatic stresses in a cable	Book3, Ch. 1

37	Grading of cables	Book3, Ch. 1
38	Insulation resistance of cables	Book3, Ch. 1
39	Capacitance of single core cables	Book3, Ch. 1
40	Capacitance three core cables.	Book3, Ch. 1

ADDITIONAL WEB RESOURCES

1.	**MOOC:** Electric Power Systems https://www.coursera.org/learn/electric-power-systems?action=enroll
2.	**NPTEL:** Video lectures on "Power System Engineering" Lecture series by Prof. Debapriya Das Department of Electrical Engineering, IIT Khargpur https://archive.nptel.ac.in/courses/108/105/108105104/

GRADING AND ASSESSMENT

- **Sessional Test**: 20 marks
- **Assignment**: 20 marks
- **Attendance**: 10 marks
- **Final Examination**: 100 marks

COURSE POLICIES

- **Attendance**: Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Academic Integrity**: MIET's academic integrity policies apply. Plagiarism will not be tolerated.
- **Late Submissions**: Assignments and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**

  Monday (12:05 PM - 12:55 PM)
  Friday (12:05 PM - 12:55 PM)

- **Contact Information**
  bhanu,ee@mietjammu.in