

Extra High Voltage AC Transmission
(IV Year B.Tech. II Sem.)

| Sl. No | Name of the Topic | No. of Classes required | Cumulative number of periods | Teaching AID |
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| Unit – I : Preliminaries | | | | |
| 1. | Necessity of EHV AC transmission | 1 | 1 | Chalk & Talk |
| 2. | Advantages and drawbacks of EHVAC Transmission | 1 | 2 | Chalk & Talk |
| 3. | Power handling capacity and line losses | 1 | 3 | Chalk & Talk |
| 4. | Mechanical considerations | 1 | 4 | Chalk & Talk |
| 5. | Tutorial Class | 1 | 5 | Chalk & Talk |
| 6. | Resistance of conductors and skin effect | 1 | 6 | Chalk & Talk |
| 7. | Properties of bundled conductors – bundle spacing and bundle radius | 2 | 8 | Chalk & Talk |
| 8. | Tutorial Class | 1 | 9 | Chalk & Talk |
| 9. | Unit I Assignment to be submitted by | | | |
| Unit – II : Line and Ground Reactive Parameters | | | | |
| 10. | Line inductance and capacitances | 1 | 10 | Chalk & Talk |
| 11. | Sequence inductances and capacitances | 2 | 12 | Chalk & Talk |
| 12. | Tutorial Class | 1 | 13 | Chalk & Talk |
| 13. | Modes of propagation | 2 | 15 | Chalk & Talk |
| 14. | Ground return | 1 | 16 | Chalk & Talk |
| 15. | Examples | 1 | 17 | Chalk & Talk |
| 16. | Tutorial Class | 1 | 18 | Chalk & Talk |
| 17. | Unit II Assignment to be submitted by | | | |
| Unit – III : Voltage Gradients of Conductors | | | | |
| 18. | field of point charges and its properties | 1 | 19 | Chalk & Talk |
| 19. | Field of sphere gap and field of line charges and its properties | 1 | 20 | Chalk & Talk |
| 20. | Potential relations for multi-conductors | 2 | 22 | Chalk & |

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| | | | | Talk |
| 21. | Tutorial Class | 1 | 23 | Chalk & Talk |
| 22. | Surface voltage gradient on conductors | 1 | 24 | Chalk & Talk |
| 23. | Distribution of voltage gradient on sub-conductors of bundle | 2 | 26 | Chalk & Talk |
| 24. | Tutorial Class | 1 | 27 | Chalk & Talk |
| 25. | Unit III Assignment to be submitted by | | | |
| Corona Effects – I | | | | |
| 26. | Power loss and audible noise | 1 | 28 | Chalk & Talk |
| 27. | Corona loss formulae | 1 | 29 | Chalk & Talk |
| 28. | Charge voltage diagram | 1 | 30 | Chalk & Talk |
| 29. | Tutorial Class | 1 | 31 | Chalk & Talk |
| 30. | Generation characteristics | 1 | 32 | Chalk & Talk |
| 31. | limits and measurements of Audible Noise | 1 | 33 | Chalk & Talk |
| 32. | Relation between 1-phase and 3-phase Audible Noise levels | 2 | 35 | Chalk & Talk |
| 33. | Examples | 1 | 36 | Chalk & Talk |
| 34. | Applications of corona.(Gap in the syllabus) | 1 | 37 | Chalk & Talk |
| 35. | Tutorial Class | 1 | 38 | Chalk & Talk |
| 36. | Unit IV Assignment to be submitted by | | | |
| 37. | Special Descriptive Test-1 | 1 | 39 | |
| Unit – IV : Corona Effects – II | | | | |
| 38. | Radio interference (RI) and corona pulses generation | 2 | 41 | Chalk & Talk |
| 39. | Properties and limits | 1 | 42 | Chalk & Talk |
| 40. | Frequency spectrum | 1 | 43 | Chalk & Talk |
| 41. | Tutorial Class | 1 | 44 | Chalk & Talk |
| 42. | Modes of propagation and Excitation function | 1 | 45 | Chalk & Talk |
| 43. | Measurement of RI, RIV and Excitation functions | 1 | 46 | Chalk & |

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| 44. | Examples | 1 | 47 | Chalk & Talk |
| 45. | Tutorial Class | 1 | 48 | Chalk & Talk |
| 46. | Unit V Assignment to be submitted by | | | |
| Electro Static Field | | | | |
| 47. | Calculation of electrostatic field of EHV AC lines | 1 | 49 | Chalk & Talk |
| 48. | Effect on humans, animals and plants | 1 | 50 | Chalk & Talk |
| 49. | Tutorial Class | 1 | 51 | Chalk & Talk |
| 50. | Electrostatic induction in un-energised circuit of double-circuit line | 2 | 53 | Chalk & Talk |
| 51. | Electromagnetic interference | 1 | 54 | Chalk & Talk |
| 52. | Examples | 1 | 55 | Chalk & Talk |
| 53. | Tutorial Class | 1 | 56 | Chalk & Talk |
| 54. | Unit VI Assignment to be submitted by | | | |
| Unit – V : Travelling Wave Theory | | | | |
| 55. | Travelling wave expression and solution | 1 | 57 | Chalk & Talk |
| 56. | Source of excitation, Terminal conditions- open circuited and short-circuited end | 2 | 59 | Chalk & Talk |
| 57. | Reflection and refraction coefficients | 1 | 60 | Chalk & Talk |
| 58. | Tutorial Class | 1 | 61 | Chalk & Talk |
| 59. | Lumped parameters of distributed lines-generalized constants | 1 | 62 | Chalk & Talk |
| 60. | No load voltage conditions and charging current | 1 | 63 | Chalk & Talk |
| 61. | Tutorial Class | 1 | 64 | Chalk & Talk |
| 62. | Unit VII Assignment to be submitted by | | | |
| Voltage Control | | | | |
| 63. | Power circle diagram and its use | 1 | 65 | Chalk & Talk |
| 64. | Voltage control using synchronous condensers | 1 | 66 | NPTEL |
| 65. | Tutorial Class | 1 | 67 | Chalk & Talk |
| 66. | Cascade connection of shunt and series compensation | 2 | 69 | Chalk & |

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| | | | | Talk |
| 67. | Sub synchronous resonance in series capacitor | 1 | 70 | Chalk & Talk |
| 68. | Compensated lines | 1 | 71 | Chalk & Talk |
| 69. | Static VAR compensating system | 1 | 72 | PPT |
| 70. | Tutorial Class | 1 | 73 | Chalk & Talk |
| 71. | Bulk power UHV AC transmission (Topic Beyond Syllabus) | 1 | 74 | Chalk & Talk |
| 72. | UPFC (Topic Beyond Syllabus) | 1 | 75 | PPT |
| 73. | Unit VIII Assignment to be submitted by | | | |
| 74. | Special Descriptive Test-2 | 1 | 76 | Chalk & Talk |
| 75. | Remedial Class | 1 | 77 | Chalk & Talk |
| 76. | Remedial Class | 1 | 78 | Chalk & Talk |
| 77. | Remedial Class | 1 | 79 | Chalk & Talk |
| 78. | Remedial Class | 1 | 80 | Chalk & Talk |