Lesson Plan

Name of faculty : HANUMAN

Discipline : Electrical Engineering

Semester : 7th

Subject : HIGH VOLTAGE ENGINEERING (ET-403-E)

Lesson plan duration : 15 weeks

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| **Theory** | | | | | |
| **Week** | **Lecture No.** | **Topic (Including Assignment / Test) : Planned** | **Actually covered on (date)** | | |
| **Date** | **HOD Sign.** | **Director-Principal** |
| 1st | 1 | Gases-Ionization process |  |  |  |
| 2 | Town send’s current growth equation |  |  |  |
| 3 | 1st and 2nd ionization coefficients |  |  |  |
| 4 | Town send’s criterion for breakdown |  |  |  |
| 2nd | 5 | Streamer theory of breakdown |  |  |  |
| 6 | Paschen’s law of gases, Gases used in practice |  |  |  |
| 7 | Liquid Dielectrics-Conduction & breakdown in pure & commercial liquids |  |  |  |
| 8 | Suspended particle theory |  |  |  |
| 3rd | 9 | Stressed oil volume theory, Liquid dielectrics used in practice |  |  |  |
| 10 | Solid Dielectrics-Intrinsic, electromechanical and thermal breakdown |  |  |  |
| 11 | Composite dielectric, Solid dielectrics used in practice |  |  |  |
| 12 | Revision of 1st unit |  |  |  |
| 4th | 13 | Application of insulating materials in power transformers, rotating machines, circuit breakers, cables and power capacitors |  |  |  |
| 14 | Generation of high D.C, A.C impulse voltage and impulse currents |  |  |  |
| 15 | Tripping and control of impulse generators |  |  |  |
| 16 | Measurement of high D.C, A.C (Power frequency & high freq.) voltages |  |  |  |
| 5th | 17 | Various types of potential dividers |  |  |  |
| 18 | Generating voltmeter |  |  |  |
| 19 | Peak reading A.C Voltmeter |  |  |  |
| 20 | Digital peak voltmeter |  |  |  |
| 6th | 21 | Electrostatic voltmeter |  |  |  |
| 22 | Sphere gap method |  |  |  |
| 23 | Factors influencing the spark voltage of sphere gaps |  |  |  |
| 24 | Revision of 2nd unit |  |  |  |
| **7th** |  | **1stSessionals** | | | |
| 8th | 25 | Discussion of 1st sessional |  |  |  |
| 26 | High Voltage testing of Electrical Apparatus: Testing of insulators |  |  |  |
| 27 | Testing of bushings, circuit breakers |  |  |  |
| 28 | Testing of power capacitors & power transformers |  |  |  |
| 9th | 29 | Over Voltage Phenomenon & Insulation Co-ordination: Theory of physics of lightning flashes and strokes |  |  |  |
| 30 | Insulation co-ordination |  |  |  |
| 31 | Volt time and circuit time characteristics |  |  |  |
| 32 | Boys camera |  |  |  |
| 10th | 33 | Standard voltage & current shapes produced in Lab |  |  |  |
| 34 | Horn gap |  |  |  |
| 35 | Single diverters |  |  |  |
| 36 | Ground wires |  |  |  |
| 11th | 37 | Surge absorbers |  |  |  |
| 38 | Revision of 3rd unit |  |  |  |
| 39 | EHV Transmission & Corona Loss: Need for EHV transmission |  |  |  |
| 40 | Use of bundled conductors, corona characteristics of smooth bundled conductors with different configurations |  |  |  |
| 12th | 41 | Corona loss, factors affecting the corona |  |  |  |
| 42 | Shunt and Series compensation of EHV lines |  |  |  |
| 43 | Tuned power lines |  |  |  |
| 44 | HVDC Transmission |  |  |  |
| 13th | 45 | Advantages, disadvantages & economics of HVDC transmission system |  |  |  |
| 46 | Types of DC links |  |  |  |
| 47 | Converter station equipment & their characteristics |  |  |  |
| 48 | Revision of 4th unit |  |  |  |
| **14th** |  | **2ndSessionals** | | | |
| 15th | 49 | Discussion of 2ndsessional |  |  |  |
|  | 50 | Revision |  |  |  |
|  | 51 | Revision |  |  |  |
|  | 52 | Problem discussion |  |  |  |