

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY  
HYDERABAD

IV Year II Sem

T	T/P/D	C
3	1	3

**EHV AC TRANSMISSION**  
(Elective-IV)**Unit – I: Preliminaries:**

Necessity of EHV AC transmission – advantages and problems – power handling capacity and line losses – mechanical considerations – resistance of conductors – properties of bundled conductors – bundle spacing and bundle radius – Examples.

**Unit – II: Line and ground reactive parameters:**

Line inductance and capacitances – sequence inductances and capacitances – modes of propagation – ground return – Examples

**Unit – III: Voltage gradients of conductors:**

Electrostatics – field of sphere gap – field of line charges and properties – charge – potential relations for multi-conductors – surface voltage gradient on conductors – distribution of voltage gradient on sub-conductors of bundle – Examples.

**Unit – IV: Corona effects – I:**

Power loss and audible noise (AN) – corona loss formulae – charge voltage diagram – generation, characteristics – limits and measurements of AN – relation between 1-phase and 3-phase AN levels – Examples.

**Unit – V: Corona effects – II:**

Radio interference (RI) – corona pulses generation, properties, limits – frequency spectrum – modes of propagation – excitation function – measurement of RI, RIV and excitation functions – Examples.

**Unit – VI: Electro static field:**

Electrostatic field: calculation of electrostatic field of EHV/AC lines – effect on humans, animals and plants – electrostatic induction in unenergised circuit of double-circuit line – electromagnetic interference – Examples.

**Unit- VII: Traveling wave theory**

Traveling wave expression and solution – source of excitation – terminal conditions – open circuited and short-circuited end – reflection and refraction coefficients – Lumped parameters of distributed lines – generalized constants – No load voltage conditions and charging current.

**Unit – VIII: Voltage control:**

Power circle diagram and its use – voltage control using synchronous condensers – cascade connection of shunt and series compensation – sub synchronous resonance in series capacitor – compensated lines – static VAR compensating system.

**TEXT BOOKS:**

1. EHVAC Transmission Engineering by R. D. Begamudre, New Age International (p) Ltd.
2. HVAC and DC Transmission by S. Rao