101009/EE100D- PRINCIPLES OF ELECTRICAL ENGINEERING
Course Contents and Lecture Schedule

No	Topic	No. of Lectures
1	**Introduction**	
1.1	**Elementary concepts of DC electric circuits:** Concept of Potential difference, voltage, current, Fundamental linear passive and active elements to their functional current-voltage relation,	2
1.2	Terminology and symbols in order to describe electric networks, voltage source and current sources, ideal and practical sources, concept of dependent and independent sources,	2
1.3	Kirchhoff-s laws and applications to network solutions using mesh and nodal analysis	2
1.4	Concept of work, power, energy, and conversion of energy.	1
2	**DC Circuits**	
2.1	Current-voltage relations of the electric network by mathematical equations to analyze the network	1
2.2	(Thevenin's theorem, Norton's Theorem, Maximum Power Transfer theorem)	3
2.3	Simplifications of networks using series-parallel, Star/Delta transformation. Superposition theorem.	3
3	**AC Circuits**	
3.1	AC waveform definitions, form factor, peak factor,	1
3.2	study of R-L, R-C,RLC series circuit, R-L-C parallel circuit, phasor representation in polar and rectangular form,	2
3.3	concept of impedance, admittance, active, reactive, apparent and complex power, power factor,	2
3.4	3 phase Balanced AC Circuits (⅄-Δ & ⅄-⅄).	2

4	**Electrostatics and Electro-Mechanics**	
4.1	Electrostatic field, electric field strength, concept of permittivity in dielectrics, capacitor composite, dielectric capacitors, capacitors in series and parallel, energy stored in capacitors, charging and discharging of capacitors,	1
4.2	Electricity and Magnetism, magnetic field and Faraday's law, self and mutual inductance, Ampere's law, Magnetic circuit,	2
4.3	Single phase transformer, principle of operation, EMF equation, voltage ratio, current ratio, KVA rating, efficiency and regulation,	2
4.4	Electromechanical energy conversion.	3
5	**Measurements and Sensors**	
5.1	Introduction to measuring devices/sensors and transducers (Piezoelectric and thermo-couple) related to electrical signals, Elementary methods for the measurement of electrical quantities in DC and AC systems (Current & Single-phase power).	3
5.2	Electrical Wiring and Illumination system: Basic layout of the distribution system, Types of Wiring System & Wiring Accessories, Necessity of earthing, Types of earthing, Safety devices & system.	4
5.3	For Further Reading - Principle of batteries, types, construction and application, Magnetic material and B-H Curve, Basic concept of indicating and integrating instruments.	2