

3rd Year 1st Semester

Sl. No	Course Code	Course Title	Hours/Week		Credit
			Theory	Practical/ Sessional	
1	EEE 3101	Electrical Measurement & Instrumentation	3		3
2	EEE 3102	Electrical Measurement & Instrumentation Sessional		3	1.5
3	EEE 3103	Digital Electronics	3		3
4	EEE 3104	Digital Electronics Sessional		3	1.5
5	EEE 3105	Power System I	3		3
6	EEE 3106	Power System I Sessional		3	1.5
7	EEE 3107	Power Electronics and Industrial Drives	3		3
8	EEE 3108	Power Electronics and Industrial Drives Sessional		3	1.5
9	GED 3101	Engineering Management	3		3
			15	12	21.00

Core Courses

1. EEE 3101 Electrical Measurement & Instrumentation

Contact hours/week: 3, Credit: 3

Introduction: Methods of measurement. Statistical method applied to field of measurement and error analysis and calibration. Resistance, Inductance and Capacitance measurements: Different methods of measuring high, medium and low resistances. Methods of measuring self and mutual inductance and capacitance. A.C. and DC bridge methods, Measurement of insulation and earth resistances. Localization of cable faults. Magnetic measurement: Flux meter, Flux and Flux density measurement. Determination of iron losses and their separation.

Measuring instruments: Classification of measuring instruments. Ammeter, Voltmeter, wattmeter, AVO meter, Energy meter, Ampere-hour meter and Maximum demand meter for measuring AC and DC quantities. Speed, frequency and phase difference measurements. Illumination measurement.

Electronic measuring instruments: Digital instruments, VTVM, Q-meter and CRO.

Instrumentation: Extension of instrument range. Use of C.T. and P.T and calculation of their burden, Instrumentation of substation. Measurement of non-electrical quantities: Transducer. Measurement of temperature, pressure, displacement, velocity, acceleration. Strain gauge and their applications.

2. EEE 3102 Measurement & Instrumentation Sessional

Contact hours/week: 3, Credits: 1.5

In this course students will perform experiments to verify practically the theories and concepts learned in EEE 3101.

3. EEE 3103 Digital Electronics

Contact hours/week: 3, Credit: 3

Analysis and Synthesis of Digital Logic Circuits: Number system, codes, and conversion. Boolean algebra, De Morgan's law, logic gates and truth tables, combinational logic design, minimization techniques, implementation of basic static logic gates in CMOS and BiCMOS. Arithmetic and data handling logic circuits, decoders and encoders, multiplexers and combinational circuit design.

Programmable Logic Devices: Logic arrays, Field Programmable Logic Arrays and Programmable Read Only Memory.

Sequential Circuits: Different types of latches, flip-flops and their design using ASM approach, timing analysis, timing analysis and power optimization of sequential circuits. Modular sequential logic circuit design: Shift registers, counters and their applications.

4. EEE 3104 Digital Electronics Sessional

Contact hours/week: 3, Credit: 1.5

In this course students will perform experiments to verify practically the theories and concepts learned in EEE 3203.

5. EEE 3105 Power System I

Contact hours/week: 3, Credit: 3

Power factor Improvement: Causes, Power factor improvements process.

Electric power Supply System: Electric power supply system, AC power supply, high voltage transmission, elements of power transmission, economics choice of conductor size and voltage.

Mechanical Design of overhead lines: Conductor materials, line support, insulator, string efficiency, Corona and corona power loss.

Transmission line parameters: Inductance - inductance due to internal flux, flux linkages between points external to an isolated conductor, flux linkages of one conductor in a group, single-phase two-wire line, composite-conductor lines, three-phase lines with equilateral/unsymmetrical spacing, double circuits, bundled conductors; Capacitance - electric field of a long straight conductor, potential difference between points due to a charge, capacitance of a two-wire line, capacitance of three-phase line with equilateral/unsymmetrical spacing, effect of Earth on transmission line capacitance, bundled conductor, parallel-circuit three-phase lines.

Performance of Transmission line: Classification, Equivalent circuit of short, medium and long lines.

Underground cables: Types and construction; oil filled, gas insulated and XLPE cables; electrical characteristics - electrical stress, capacitance, charging current, insulation resistance, dielectric power factor and dielectric loss, skin effect, proximity effect; identification of fault location.

Distribution systems: Primary and secondary distribution - radial, ring main, and interconnected system, distribution losses and feeder reconfiguration. Cable testing, DC Distribution, AC distribution.

Voltage control: Importance, Methods of voltage control, Tap changing transformer, phase shifting, booster and regulation transformer and shunt capacitor.

6. EEE 3106 Power System I Sessional

Contact hours/week: 3, Credit: 1.5

In this course students will perform experiments to verify practically the theories and concepts learned in EEE 3105.

7. EEE 3107 Power Electronics and Industrial Drives

Contact hours/week: 3, Credit: 3

Fundamental of power electronics, characteristics of static power semiconductor devices (BJT, MOSFET, IGBT, Thyristors).

AC/DC power converters: uncontrolled rectifiers (single phase and three phase), controlled rectifiers (single phase and three phase), dual converter.

AC/AC power converters: phase-controlled converters (single phase and three phase), AC switch, cyclo-converter.

DC/DC converters: choppers (step down and step up), switching regulators (buck, boost, buck-boost).

DC/AC converters: types, single phase and three phase inverters. Various applications of converters.

Introduction to power electronics control of motor: DC motor speed control, braking, scalar control of poly-phase induction motor.

Industrial Application: Introduction to Electric arc furnace, Dielectric heating and induction heating.

8. EEE 3108 Power Electronics and Industrial Drives Sessional

Contact hours/week: 3, Credit: 1.5

In this course students will perform experiments to verify practically the theories and concepts learned in EEE 3107.

General Education Courses

9. GED 3101 Engineering Management

Contact hours/week: 3, Credit: 3

Business and industrial law: Law of contract, elements of valid contract. Consideration, Parties competent to contract. Sale of goods, hire and purchase. Negotiable instrument.

Industrial law in Bangladesh: various ordinance payments of wages, legislation relating employment in industries, factories, shops and agriculture, trade union act. Human resources management in business: Human factors and motivation, leadership, group decision making and communication, job gradation, process of performance appraisal and reward systems, managing information for decision and management information systems.

Marketing management: Understanding marketing management, developing marketing strategies, conducting marketing research, analyzing consumer and business market, identifying market segments and targets, dealing with competition.

Safety: Evolution of modern safety concepts, industrial hazard, safety and risk management, productivity, worker health and safety, proactive management techniques for safety management, safety standards and regulations for engineering works, fire safety, hazardous materials.