(BTEEL306)ELECTRICAL MACHINE-I LABORATORY 01 Credits

Perform Any eight experiment from given list as a part of practical submission

List of Experiments

1. To perform the polarity test on single phase transformer
2. To perform the transformation ratio test on single phase transformer
3. To perform the following three phase transformer connections:
   1) Star-star 2) Star-Delta
   3) Delta – Delta 4) Delta –Star
   5)Open Delta 6) Scott Connection
4. To perform the direct loading test on three phase transformer to calculate efficiency and regulation
5. To perform the indirect loading test on three phase transformer to calculate efficiency
6. To perform the parallel operation of two single phase transformers.
7. To study D. C. Machine
8. To draw the speed characteristics of DC shunt motor by- (1) Armature Control method (2) Field Control method
9. To perform the load test on DC Shunt motor.
10. To study the load characteristics of DC generator
    I) Cumulative compound generator.
    II) Differential compound Generator
11. To study the magnetization ,internal and External characteristics of a D. C. generator
12. To Study Starters for DC Shunt Motor.

BTEEL307 ELECTRICAL & ELECTRONICS MEASUREMENTS LABORATORY 1 Credit

List of Experiments: (Perform minimum 8-10 experiments from following list)

1) Measurement of Low resistance by Kelvin Double bridge.
2) Measurement of High resistance and Insulation resistance using Megger.
3) Measurement of Inductance by Maxwell bridge, Hays bridge, Anderson bridge.
4) Measurement of Capacitance by De Sauty bridge, Schering bridge.
5) Measurement of Earth resistance using Earth Tester.
6) Study the extension of Voltmeter, Ammeter and Wattmeter.
7) Measurement of three phase power by Two Wattmeter and One Wattmeter method.
8) Study of types of instrument: PMMC, Moving Iron, Electro-dynamometer, Hot wire, Thermocouple, Induction, Electrostatic, Rectifier.
9) Study of Energy Meter.
10) Study of Instrument T/F and its types.
11) Characterize the temperature sensor (RTD):
    a) Static Characteristics of RTD: Study the change in resistance of RTD probe depending on the process temperature.
    b) Dynamic characteristics: Study the dynamic response of RTD probe
12) Characterize the Thermocouple:
    a) Static Characteristics of Thermocouple: Study the change in EMF of a thermocouple in response to the process temperature.
    b) Dynamic characteristics of Thermocouple: Study the dynamic response of Thermocouple.
13) Characterize of LVDT: To find the effect of various parameters like change in supply voltage, change in supply frequency on output of given LVDT
14) Characterize the strain gauge sensor:
    a) Study of Strain Gauge: To study the working principle of strain gauge.
    b) Study of effect of change in position of weight applied on Strain Gauge performance.
    c) Study of effect of change in temperature on the performance of Strain Gauge.
15) Measurement of phase difference and frequency of a sinusoidal ac voltage using C.R.O.
16) Study of storage oscilloscope and determination of transient response of RLC circuit.

BTEEL406 NETWORK THEORY LAB 1 Credits

Any Eight Experiments from the following list

Expt. No.	Title of Experiment
1	Verification of Kirchhoff's Laws
2	Verification of Superposition Theorem
3	Verification of Thevenin's Theorem
4	Verification of Norton's Theorem
5	Verification of Maximum Power Transfer Theorem
6	Verification of Reciprocity Theorem
7	Determination of transient response of RL & RC series circuits
8	To study Resonance in RLC series Circuit.
9	To study Resonance in parallel RLC Circuit.
10	Determination of driving point and transfer functions of a two port ladder network and verifywith theoretical values
11	To calculate and verify 'Z'Parameters of a Two-Port Network.
12	To calculate and verify 'Y' parameters of Two-Port Network.

BTEEL407 : Power System Lab **1 Credit**

Sr. No	Experiment Title
1	To study the layout of a Thermal Power Plant with its components.
2	To study the layout, classification and components of a Hydro Power Plant.
3	To study the alternator excitation system
4	To study the types and properties of various Overhead insulators
5	To study the types and properties of various Overhead Conductors.
6	To study the Power cable and its various components and types.
7	To study the layout of a substation along with its components
8	To determine the ABCD parameters of a medium and long transmission line.
9	To Visit a Thermal Power plant and write a technical report on the observations

(BTEEL408)ELECTRICAL MACHINE-II LABORATORY 01 Credits

Perform Any Eight experiment from given list as a part of practical submission

List of Experiment

1. Determination of sequence impedances of salient pole synchronous machine To perform
2. Determination of Xd and Xq of a salient pole synchronous machine from slip test.
3. V and inverted V curves of a3-phasesynchronous motor 1
4. Regulation of alternator by Direct loading method (R,L,C load)
5. Regulation of alternator by synchronous impedance method
6. Regulation of alternator by MMF method
7. Parallel operation of Synchronous generator
8. To study different types of starters for three phase Squirrel cage induction motor
9. Rotor resistance starter for slip ring induction motor.
10. To conduct no load and blocked rotor test and to determine performance characteristics of three phase induction motor from circle diagram
11. Load and block rotor tests on squirrel cage induction motor
12. Brake test on slip ring induction motor
13. To control speed of wound rotor induction motor by rotor resistance control method
14. To control speed of induction motor by V/F
15. To control speed of induction motor by i) star-delta ii) autotransformer

(BTEEL409) ANALOG AND DIGITAL ELECTRONICS LAB 01 Credits

Perform Any Eight experiment from given list as a part of practical submission

List of Experiment

1. To plot input characteristics and Output characteristics of common emitter configuration.
2. To plot frequency response of RC coupled and Transformed coupled amplifier
3. To measurement of OP-AMP parameter
4. To verify the operation of op amp in Inverting & Non-inverting mode on AC input
5. Verify truth table of following basic and derived gates
    a. AND, OR, AND
    b. Ex-OR, NAND, NOR
6. Verification of truth table of flipflop
7. Design and implementation of 3-bit synchronous up/down counter
8. Design and implementation of half and full adder using logic gates
9. Design and implementation of Multiplexer and De-multiplexer and study of IC74150 and IC 74154
10. Design and implementation of code converters
    a. Binary to gray code converter
    b. BCD to Excess 3

BTEEL507 POWER SYSTEM ANALYSIS LAB **1 Credit**

Any Eight Experiments from the following list.(Any Experiment from the following list can be performed either SCILAB/MATLAB/Any Other Software.)

1. Write a program to draw the per unit reactance diagram of a given power system.
2. Solution of building the Bus Admittance matrix for given power system network.
3. Solution of power flow problem of a given power system using Gauss-Siedel method.
4. Solution of power flow problem of a given power system using Newton Raphson Method.
5. Solution of power flow problem of a given power system using Fast Decoupled method.
6. Single Line to Ground Fault (L-G) analysis of a Three Phase Transmission Line at no load and light load conditions.
7. Line to Line Fault (L-L) analysis of Three Phase Transmission Line at No load and Light load conditions.
8. Double Line to Ground Fault (LLG) analysis of Three Phase Transmission Line at No load and Light load conditions.
9. Symmetrical L-L-L Fault analysis of Three Phase Transmission Line at No load and Light load conditions.

BTEEL508 MICROPROCESSOR AND MICROCONTROLLER LAB 01 Credit

1	Study of Architecture of 8085
2	Assembly language program for addition and subtraction of 8 bit &16 bit numbers based on 8085 microprocessor
3	Assembly language program for multiplication of two numbers based on 8085 microprocessor
4	Assembly language program for Multiplication and division of two numbers based on 8085 microprocessor
5	Assembly language program for determination of smaller and larger no based on 8085 microprocessor
6	Assembly language program for ascending and descending order based on 8085 microprocessor
7	Assembly language program for rolling/flash LED based on 8085 microprocessor
8	Interfacing of 7 segment LED to 8085 microprocessor
9	Interfacing of Stepper motor with microprocessor
10	Programs based on arithmetic instructions for 8051 microcontroller
11	Interfacing of stepper motor to 8051 microcontroller
12	Interfacing of DC motor to 8051 microcontroller
13	Interfacing of converters ADC 0808/0809 and DAC 0808
14	Generate Delay using Timer section of 8051 microcontroller.

Conduct any 4 practicals fro 1 to 7 and 4 practicals from 8 to 14.

BTEEL509 POWER ELECTRONICS LAB **01 CREDIT**

1.V-I characteristics of various power electronics devices.(At least two devices SCR/MOSFET/IGBT/TRIAC/GTO)

Group A (minimum four)

2.Experimental analysis of single phase uncontrolled converter

3.Experimental analysis of single phase Half controlled converter

4.Experimental analysis of single phase fully controlled converter

5.Experimental analysis of three phase bridge inverter.

6.Experimental analysis of BUCK /BOOST/BUCK -BOOST converter

Group B

7.Simulation of Single phase Semi controlled converter

8.Simulation of Single phase Fully controlled converter

9.Simulation of Single phase inverter

3. Vernan Cooray. ” Lightning Protection”.Power and Energy services, IET.

BTEEL606 SWITCHGEAR AND PROTECTION LAB 01 CREDITS

Conduct any 8practicals from given list

1. To verify characteristics of Static Overcurrent Relay.
2. To verify the characteristics Static over Voltage Relay.
3. To verify the characteristics of IDMT Relay.
4. To verify the characteristics of Reverse Power Overcurrent Relay/ Negative Sequence Relay.
5. To demonstrate working of Distance Protection Scheme for long transmission line.
6. To demonstrate working of Differential Protection of Transformer and sketch the schematic diagram for protection scheme.
7. To demonstrate working of Differential Protection of Alternator and sketch the schematic diagram for protection scheme.
8. Identify the components of different types of circuit breakers with their specifications (through visits/ videos/models)
9. To verify the characteristics of MCB, ELCB and HRC fuses.

BTEEL 607 ELECTRICAL MACHINE DESIGN LAB 01 Credit

Conduct any eight practical from given list

1 Symbols used in Electrical Engineering

2 Design and assembly of Choke with design report.

3 Design and assembly of Starter with design report.

4 Design and layout of simplex lap winding (Detailed Drawing Sheet)

5 Design and layout of wave winding (Detailed Drawing Sheet)

6 Design and layout of ac lap winding (Detailed Drawing Sheet)

7 Design and assembly of transformer with design report. (Detailed Sheet for General Assembly of transformer)

8 Design and assembly of three phase induction Motor with design report.(Detailed Sheet for General Assembly of Induction Motor)

9 Complete any two drawings sheets with the help of Computer Aided Design Software like AUTOCAD)

BTEEL608 CONTROL SYSTEM ENGINEERING LAB 01 Credit

Any Eight Experiments from the following list.

1. Write a program to obtain: i) pole, zero and gain values from a given transfer functionii)Transfer function model from pole, zero, gain values.
2. Write a program to determine of step & impulse response for a first order unity feedback system
3. Write a program to generate various standard test signals.
4. Write a program to plot the root locus for a given transfer function of the system using MATLAB.
5. Write a program to plot the Bode Plot for a given system using MATLAB.
6. Write a program to plot the Nyquist Plot for a given system using MATLAB.
7. Write a program to design Proportional, Proportional + Integral, Proportional+ Derivative and P-I-D Controller for second order system.
8. Write a program to determine of step & impulse response for a second order unity feedback system
9. Write a program to determine state space model from transfer function model & vice versa.
10. Write a program to determine state space model from transfer function model & vice versa

BTEEL706: POWER SYSTEM OPERATION AND CONTROL LAB	
Teaching Scheme:	Examination Scheme:
Practical: 2hr	Continuous Assessment: 30 Marks
Total Credits: 1	End Term Exam: 20 Marks

Sr. No.	List of the Experiment
1	Write a program for economic dispatch in power systems using
2	Simulation of Automatic voltage regulator using MATLAB.
3	Write a program to compute the voltage and power factor for a given system using MATLAB.
4	Write a program to solve Swing Equation by Classical Method.
5	Write a program to plot power angle curve of synchronous machine using MATLAB.
6	Write a program to solve the given Equal Area Criteria problem using MATLAB.
7	To demonstrate the Excitation System for Synchronous machine using MATLAB
8	Simulation of single area load frequency control using MATLAB.

BTEEL707: HIGH VOLTAGE ENGINEERING LAB	
Teaching Scheme:	Examination Scheme:
Practical: 2hr	Continuous Assessment: 30 Marks
Total Credits: 1	End Term Exam: 20 Marks

Sr. No.	List of Experiment
1	Study of Faraday Cage for HV labs.
2	Study of Standard HV Laboratory layouts.
3	One min. (1-min.) DC high voltage withstand test on Equipment. (Max. up to 10 KV).
4	Effect of gap length on liquid insulating material.
5	Breakdown Strength of composite dielectric material.
6	Study of impulse generator.
7	High voltage withstand test on cables/safety gloves/shoes, as per IS. (Max. 2.25 KV DC)
8	Horn gap arrangement as surge diverter.
9	Measurement audible and visible corona inception and extinction voltage
10	Development of tracks and trees on polymeric insulation.
11	Study of Effect of EHV field on Human, Animals & Plants.

BTEEL708: ELECTRICAL DRIVES LAB	
Teaching Scheme:	Examination Scheme:
Practical: 2hr	Continuous Assessment: 30 Marks
Total Credits: 1	End Term Exam: 20 Marks

Pre requisite	Basic electronics engineering, basic electronics engineering Course
Course Outcome	• Efficiently use various AC and DC drive. • Simulate various drive system
Sr.No	List of Experiments
1	Study the ramp comparator firing circuit.
2	Study of single phase half wave converter and semi converter DC Drive .
3	Study of single phase full controlled converter (Bridge converter) DC Drive.
4	Speed control of DC motor using chopper.
5	Simulation of single phase half wave and semiconductor controlled DC drive.
6	Simulation of chopper fed DC Drive .
7	Study of AC Drive .
8	Study of V/f control of AC drive
9	Study the inverter fed induction motor drive.
10	Simulation of AC drive .