- Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity, case studies.
- Energy Resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies
- Land Resources: Land as a resource, land degradation, man induces land slides, soil erosion, and desertification.

b) Role of individual in conservation of natural resources.

Unit 3: Eco Systems

- Concept of an eco system
- Structure and function of an eco system.
- Energy flow in the eco systems.
- Food chains, food webs and ecological pyramids.

UNIT 4: Biodiversity and it's Conservation

- Introduction-Definition: genetics, species and ecosystem diversity.
- Biogeographically classification of India.
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, national and local level.
- India as a mega diversity nation.

UNIT 5: Environmental Pollution

Definition Causes, effects and control measures of:

a. Air pollution
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear hazards

Solid waste Management: Causes, effects and control measures of urban and industrial wastes

Role of an individual in prevention of pollution Pollution case studies

Disaster management: Floods, earth quake, cyclone and land slides

Unit 6: Social issues and the Environment

- Form unsustainable to sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, water shed management
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies.
- Environment protection Act
- Air (prevention and control of pollution) Act
- Water (prevention and control of pollution) Act
- Wildlife protection act
- Forest conservation act
- Issues involved in enforcement of environmental legislations
- Public awareness

Unit 7: Human population and the environment

- Environment and human health
- Role of information technology in environment and human health

Unit 8: Field work

Visit to a local area to document environment assets river / forest / grassland / hill

/ mountain. Visit to a local polluted site-urban/rural/industrial/agricultural. Study of common plants, insects, birds. Study of simple ecosystems-pond, river, hills lopes, etc (field work equal to 5 lecture works)

Course Outcomes:

At the end of the course the following things are expected:

1. Students will understand the basics of environmental science.
2. Students will learn about causes of different pollution and their remedies.
3. The students will learn about social issues that are connected to environment
4. Students learning can be applicable for protection of environment

Recommended Books:

1. Textbook of Environmental studies, Erach Bharucha, UGC

2. Fundamental concepts in Environmental Studies, D D Mishra, S Chand & Co Ltd

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PCC-EE- 401.Electrical Measurement & Instrumentation

Category	Code	Course Title	L	T	P	CR	PR	OR	TW	MSE	ESE	Total Mark
Professional core courses	PCC-EE 401	Electrical Measurement & Instruments	3	0	2	4	25#	-	50	30	70	175

Course objectives:

1. To expose the students to a broad knowledge of experimental methods and measurement techniques
2. To train the students in the skill of operation of instruments in the electrical & electronic engineering applications
3. To understand the basic working of instruments used for measurement
4. To understand the errors in measurements and their rectification
5. To gain proficiency in the use of common measuring instruments
6. To compare theoretical predictions with experimental results and to resolve any apparent differences.

Course Contents:

Unit 1:Theory Of Measurement: (8 Hours)

Theory of measurement; accuracy, precession, errors. Measurement of electrical signals, Voltage measurement, current measurement, resistance measurement, and power measurement, by operating principles of electromechanical instruments [MI, MC, Induction type] and by methods of substitution. Measurement of flux. Energy meter

Unit 2: Measurement of R ,L,C (6 Hours)

Measurement of low, medium and high resistance, D.C. potentiometer, Kelvin double bridge, bridge, megger. A.C bridges for measurement of inductance & capacitance: Maxwell bridge, Anderson bridge, De-sauty bridge, Schering bridge, Hay's bridge.

Unit 3: Errors (6 Hours)

Systematic errors, Random errors, Total measurement system errors, system Disturbances due to measurement, modifying inputs, Random errors, total measurement system errors, Mean &median values, Std. Deviation and variance, concepts of histogram, bell shape distribution, frequency distribution of errors, and error boundaries

Unit 4:Instruments Properties: (8 Hors)

Instruments classification, characteristics of instruments, Selection of instruments, Functions of instruments, Comparison of analog and digital instruments. Electrical Instrument: multimeter, clampmeters, Power factor meter, Frequency measurement, Earth resistance and leakage current tester, Electrical resonance type frequency meter, Synchroscopes.

Unit 5: Basic Concepts (8 Hours)

Instrument calibration reference standards, concepts and basic circuits like [amplification, attenuation, signal linearization, filtration, Bias shift etc.] for analog signal processing, introduction of Digital signal processing, manipulation needs and transmission of signals.

Unit 6: Sensors and Transducers (4 Hours)

Sensors & transducers, classification of sensors, principle of operation of Temperature sensors (RTD, thermocouple), pressure sensors (load cells, resonant wire device, Pirani gauge), electromagnetic flow meters, ultra-sonic flow meters, fiber optic level sensors and LVDT. Photo & electromagnetic sensors. [This entire Unit VI has descriptive treatment only.]

Course outcome:

On completion of this course, students should be able to:

1. Discuss the operating principles of common electrical and electronic measuring

instruments, devices and circuits, and their application to testing;

2. Measure the performance of equipment and circuits;
3. Identify and classify error sources, and explain how their effects can be minimized in particular measurement situations;
4. Discuss human and environmental implications of measurement systems;
5. Analyze single- and three-phase circuits to determine voltage and current values;
6. Analyze test measurements and circuit performance mathematically in both time and frequency domains;
7. Specify details of instrumentation and devices intended for a particular application;
8. Evaluate the results of tests and measurements taken from circuitry constructed by the student.

Text/Reference Books:

1. A.K. Sawhney, "A course in Electrical & Electronic Measurements & Instrumentation", Publication- DhanpatRai& Sons, Edition 1995.
2. E.W Golding; "Electric Measurement & Measuring Instruments", Publication - A. H. Wheeler & Co, Allahabad, Edition 1983.
3. Helfrick and cooper, "Modern Electronic Instrumentation & Measurement Techniques", Publisher- Pearson, Edition 2007.
4. M. A. Baldwin, "Fundamentals of Electrical Measurements", Publication - Lyall Book Depot, Ludhiyana, Edition 1985.
5. M.U. Reissland, "Electrical Measurements", Publication - Wiely Eastern Ltd, New Delhi, Edition 1992.
6. V. Popov; "Electrical Measurements" Publication – Mir, Moscow, Edition 1970.
7. Jones B.E.; "Instrumentation Measurement & Feedback", Publication – Tata McGraw Hill, New Delhi, Edition 1978

Term Work:

Term work will consist of record of minimum eight experiments carried out of following

1. Measurement of power in a single phase circuit, using

   a) Three ammeter method and

b) Three-voltmeter method.

2. Measurement of power in a three phase circuit, using two- wattmeter method,
3. Measurement of temperature using any one temperature sensor.
4. Measurement of inductance using Maxwell Bridge.
5. Measurement of capacitance by bridge methods
6. Measurement of current by substitution method.
7. Measurement of small (mili-) voltage by CRO.
8. Calibration of ammeter and voltmeter by using DC potentiometer
9. Measurement of resistance (high, medium, low)
10. Measurement of earth resistance
11. Calibration of energy meter at different power factors (3 phase /1 phase).
12. Measurement of displacement using LVDT.

13 Study of digital voltmeter, digital multimeter.

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PCC-EE- 402. Electrical Machine - II

Category	Code	Course Title	L	T	P	CR	PR	OR	TW	MSE	ESE	Total Mark
Professional Core Courses	PCC-EE 402	Electrical Machine-II	3	0	2	4	50#	-	25	30	70	175

Course Outcomes:

At the end of this course, students will demonstrate the ability to

a) Understand the concepts of rotating magnetic fields.
b) Understand the operation of ac machines.
c) Analyse performance characteristics of ac machines.

Module 1: Fundamentals of AC machine windings (5 Hours)

Physical arrangement of windings in stator and cylindrical rotor; slots for windings; single turn coil - active portion and overhang; full-pitch coils, concentrated winding, distributed winding, winding axis, 3D visualization of the above winding types, Air-gap MMF distribution with fixed current through winding - concentrated and distributed, Sinusoidally distributed winding, winding distribution factor.

Module 2: Pulsating and revolving magnetic fields (6 Hours)

Constant magnetic field, pulsating magnetic field - alternating current in windings with spatial displacement, Magnetic field produced by a single winding - fixed current and alternating current Pulsating fields produced by spatially displaced windings, Windings spatially shifted by 90 degrees, Addition of pulsating magnetic fields, Three windings spatially shifted by 120 degrees (carrying three-phase balanced currents), revolving magnetic field.

Module 3: Induction Machines (10 Hours)

Construction, Types (squirrel cage and slip-ring), Torque Slip Characteristics, Starting and Maximum Torque. Equivalent circuit. Phasor Diagram, Losses and Efficiency. Effect of parameter variation on torque speed characteristics (variation of rotor and stator resistances, stator voltage, frequency). Methods of starting, braking and speed control for induction motors. Generator operation. Self-excitation. Doubly-Fed Induction Machines.

Module 4: Single-phase induction motors (4 Hours)

Constructional features double revolving field theory, equivalent circuit, and determination of parameters, Split-phase starting methods and applications.

Module 5: Special Motors (4 Hours)

Construction, principle of working, characteristics, ratings & applications of Brushless DC motors, Permanent Magnet motor, linear induction motors, and AC series motors, universal motors, repulsion type motors, hysteresis motor.

Module 6: Synchronous Generators (Alternators) (9 Hours)

Constructional features, cylindrical rotor synchronous machine - generated EMF, equivalent circuit and phasor diagram, armature reaction, synchronous impedance, voltage regulation. Operating characteristics of synchronous machines Salient pole machine – two reaction theory, analysis of phasor diagram, power angle characteristics. Parallel operation of alternators - synchronization and load division.

Module 7: Synchronous Motors (7 Hours)

Construction & principle of operation, various methods of starting, phenomenon of hunting or phase–swinging– its remedies. Operation of 3-phase Synchronous motor with constant excitation & variable load. Significance of torque angle, load characteristics Phasor diagram on the basis of synchronous impedance. Power flow

chart, losses.Operation of 3-phase synchronous motor with a constant mechanical load on its shaft & variable excitation.'V' Curves &'Inverted V' (pf) curves.Merits and demerits of synchronous motors & its application.

References Books:

1. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", McGraw Hill Education, 2013.
2. M. G. Say, "Performance and design of AC machines", CBS Publishers, 2002.
3. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers, 2011.
4. I. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw Hill Education, 2010.
5. A. S. Langsdorf, "Alternating current machines", McGraw Hill Education, 1984.
6. P. C. Sen, "Principles of Electric Machines and Power Electronics", John Wiley & Sons, 2007.

List of Practical's:

1. Direct loading test on 3-phase induction motor.
2. No load test & blocked-rotor test on 3-phase induction motor:
   (a) Determination of parameters of equivalent circuit
   (b) Plotting of circle diagram.
3. Speed control of 3-phase induction motor by
   a) V/f control b) rotor resistance starter.
4. Speed-torque characteristics of 3-phase slip-ring induction motor with different values of Resistances inserted in the rotor circuit.
5. Study of induction motor starters.
6. Load test on 1-phase induction motor.
7. No load & blocked-rotor test on a Capacitor-start 1-phase induction motor &determination of Equivalent circuit parameters.
8. Effect of variation of voltage on three phases Induction Motor
9. Direct loading test on alternator.
10. OC & SC test on alternator & determination of regulation by emf & mmf method.

11. Determination of regulation by zero power factor &potier angle method.
12. To determine the synchronous impedance of the alternator by performing open-circuit and short circuit tests and to use it to predict voltage regulation.
13. To determine the load characteristics of an alternator when operated into a 0.8 lagging power factor load.
14. V and inverted V curves of a three –phase Synchronous motor.
15. No-load& blocked rotor tests on three phase Slip ring Induction motor

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PCC-EE- 403. Power Electronics

Category	Code	Course Title	L	T	P	CR	PR	OR	TW	MSE	ESE	Total Mark
Professional Core Courses	PCC-EE 403	Power Electronics	3	0	2	4	25@	-	50	30	70	175

Course Objectives:

To enable students to gain knowledge and understanding in the following aspects,

a) Fundamental of power electronic devices and characteristics.
b) The concept and operating principles of power electronic circuit.
c) Design procedures and techniques of power electronics systems.

Module 1: Power switching devices (6 Hours)

Diode, Thyristor, MOSFET, IGBT: I-V Characteristics; Firing circuit for thyristor; Voltage and current commutation of a thyristor; Gate drive circuits for MOSFET and IGBT.

Module 2: Thyristor rectifiers (6 Hours)

Single-phase half-wave and full-wave rectifiers, Single-phase full-bridge thyristor rectifier with R-load and highly inductive load; Three-phase full-bridge thyristor rectifier with R-load and highly inductive load; Input current wave shape and power factor.

Module 3: DC-DC buck converter (7 Hours)

Elementary chopper with an active switch and diode, concepts of duty ratio and average voltage, power circuit of a buck converter, analysis and waveforms at steady state, duty ratio control of output voltage.

Module 4: DC-DC boost converter (7 Hours)

Power circuit of a boost converter, analysis and waveforms at steady state, relation between duty ratio and average output voltage.

Module 5: Single-phase voltage source inverter (8 Hours)

Power circuit of single-phase voltage source inverter, switch states and instantaneous output voltage, square wave operation of the inverter, concept of average voltage over a switching cycle, bipolar sinusoidal modulation and unipolar sinusoidal modulation, modulation index and output voltage.

Module 6: Three-phase voltage source inverter (8 Hours)

Power circuit of a three-phase voltage source inverter, switch states, instantaneous output voltages, average output voltages over a sub-cycle, three-phase sinusoidal modulation.

Course Outcomes:

At the end of this course students will demonstrate the ability to

1. Understand the differences between signal level and power level devices.
2. Analyse controlled rectifier circuits.
3. Analyse the operation of DC-DC choppers.
4. Analyse the operation of voltage source inverters.

References Books:

1. M. H. Rashid, “Power electronics: circuits, devices, and applications”, Pearson Education India, 2009.
2. N. Mohan and T. M. Undeland, “Power Electronics: Converters, Applications and Design”, John Wiley & Sons, 2007.
3. R. W. Erickson and D. Maksimovic, “Fundamentals of Power Electronics”, Springer Science & Business Media, 2007.
4. L. Umanand, “Power Electronics: Essentials and Applications”, Wiley India, 2009.

List of Practical’s:-

1. Know your Electronics lab.
2. Plot V-I characteristics of PN junction diode.

3. Plot V-I charactristics of SCR and find latching current (IL), holding current (IH) and the forward break over voltage (VFBO).
4. Determine line and load regulation using zener diode.
5. Understand the speed control of DC series motor using SCR phase control and plot speed Vs. armature voltage characteristics.
6. Observe the output waveforms of single phase full wave controlled rectifier with resistive load, inductive load with and without freewheeling diode. Measure the load voltage with variations in firing angle.
7. Plot V-I characteristics of MOSFET.
8. Plot V-I characteristics of BJT.
9. Plot V-I characteristics of DIAC
10. Plot V-I characteristics of TRIAC.
11. Observe the output waveform of three phase full wave controlled rectifier with resistive load, inductive load without and with freewheeling diode
12. Observe and draw output waveforms of single phase half wave rectifier R load
13. Observe and draw output waveforms of single phase half wave rectifier RL load
14. Observe and draw output waveforms of single phase full wave rectifier R load
15. Observe and draw output waveforms of single phase full wave rectifier RL load.
16. 3-ph voltage source transistorized inverter.
17. Firing circuit for 3-ph converter..
18. 1-ph or 3-ph. AC Voltage Regulator.
19. 3-ph AC-DC converter with RLE Load.
20. 1-Ph PWM Bridge Inverter.
21. Commutation circuits of SCR.
22. Design of Snubber Circuit

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PCC- 404.Signal & System

Category	Code	Course Title	L	T	P	CR	PR	OR	TW	MSE	ESE	Total Mark
Professional Core Courses	PCC-EE 404	Signal & System	3	1	0	4	-	-	-	30	70	100

Course Objectives:

1) Enable students to train for an intermediate level of fluency with signals and systems in both continuous time and discrete time.
2) Will helps in preparation for more advanced subjects in digital signal processing.
3) Enable students to know more about communication theory, system theory, control and robotics.

Course Contents:-

Module 1: Introduction to Signals and Systems (9 Hours)

Signals and systems as seen in everyday life, and in various branches of engineering and science. Signal properties: periodicity, absolute integrability, determinism and stochastic character. Some special signals of importance: the unit step, the unit impulse, the sinusoid, the complex exponential, some special time-limited signals; continuous and discrete time signals, continuous and discrete amplitude signals. System properties: linearity: additivity and homogeneity, shift-invariance, causality, stability, realizability. Examples.

Module 2: Behaviour of continuous and discrete-time LTI systems (10 Hours)

Impulse response and step response, convolution, input-output behaviour with aperiodic convergent inputs, cascade interconnections. Characterization of causality and stability of LTI systems. System representation through differential equations and difference equations. State-

space Representation of systems. State-Space Analysis, Multi-input, multi-output representation. State Transition Matrix and its Role. Periodic inputs to an LTI system, the notion of a frequency response and its relation to the impulse response.

Module 3: Fourier, Laplace and z- Transforms: (10 Hours)

Fourier series representation of periodic signals, Waveform Symmetries, Calculation of Fourier Coefficients. Fourier Transform, convolution/multiplication and their effect in the frequency domain, magnitude and phase response, Fourier domain duality. The Discrete Time Fourier Transform (DTFT) and the Discrete Fourier Transform (DFT). Parseval's Theorem. Review of the Laplace Transform for continuous time signals and systems, system functions, poles and zeros of system functions and signals, Laplace domain analysis, solution to differential equations and system behaviour. The z-Transform for discrete time signals and systems, system functions, poles and zeros of systems and sequences, z-domain analysis.

Module 4: Sampling and Reconstruction: (10 Hours)

The Sampling Theorem and its implications. Spectra of sampled signals. Reconstruction: ideal interpolator, zero-order hold, first-order hold. Aliasing and its effects. Relation between continuous and discrete time systems. Introduction to the applications of signal and system theory: modulation for communication, filtering, feedback control systems.

Course Outcomes:

At the end of this course, students will demonstrate the ability to

1. Understand the concepts of continuous time and discrete time systems.
2. Analys e systems in complex frequency domain.
3. Understand sampling theorem and its implications.

Text/References:

1. A. V. Oppenheim, A. S. Willsky and S. H. Nawab, “Signals and systems”, Prentice Hall India, 1997.
2. J. G. Proakis and D. G. Manolakis, “Digital Signal Processing: Principles, Algorithms, and Applications”, Pearson, 2006.
3. H. P. Hsu, “Signals and systems”, Schaum’s series, McGraw Hill Education, 2010.
4. S. Haykin and B. V. Veen, “Signals and Systems”, John Wiley and Sons, 2007.
5. A. V. Oppenheim and R. W. Schafer, “Discrete-Time Signal Processing”, Prentice Hall, 2009.
6. M. J. Robert “Fundamentals of Signals and Systems”, McGraw Hill Education, 2007.
7. B. P. Lathi, “Linear Systems and Signals”, Oxford University Press, 2009.

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BSC- 405. Mathematics -III

Category	Code	Course Title	L	T	P	CR	PR	OR	TW	MSE	ESE	Total Mark
Basic science courses	BSC-405	Mathematics – III (Probability & Statistics)	3	1	0	4	-	-	-	30	70	100

Course Objectives:

(1) To study the basic principles of Laplace Transform, Fourier series, Fourier transform, z, wavelet transforms, and their applications in engineering problems.

(2) To introduce the solution methodologies for ODE & PDE with applications in engineering.

(3) To provide an overview of probability and statistics to engineers

Course Contents:

Module 1: Fourier series (08 hours)

Orthogonal and orthonormal functions, Construction of orthonormal set, Dirichlet conditions. Fourier series of periodic function, Fourier series of even and odd functions,Half range sine and cosine series, Parseval's identities, Complex form of Fourier series, Use of Fourier series in solving heat flow, wave and elastic string equations.

Module 2 :Transform Calculus -1 (08 hours)

Polynomials – Orthogonal Polynomials – Lagrange's, Chebyshev Polynomials; Trigonometric Polynomials; Laplace Transform, Properties of Laplace Transform, Laplace transform of periodic functions. Finding inverse Laplace transform by different methods, convolution theorem. Evaluation of integrals by Laplace transform, solving ODEs and PDEs by Laplace Transform method.

Module 3: Transform Calculus-2 (06 hours)

Fourier transforms, Z-transform and Wavelet transforms: properties, methods, inverses and their applications.

Module 4: Basic Probability (08 hours)

Probability spaces, conditional probability, independence; Discrete random variables, Independent random variables, the multinomial distribution, Poisson approximation to the binomial distribution, infinite sequences of Bernoulli trials, sums of independent random variables; Expectation of Discrete Random Variables, Moments, Variance of a sum, Correlation coefficient, Chebyshev's Inequality. Continuous random variables and their properties, distribution functions and densities, normal, exponential and gamma densities.

Module 5: Bivariate Distributions and Basic Statistics (06 hours)

Bivariate distributions and their properties, distribution of sums and quotients, conditional densities, Bayes' rule. Measures of Central tendency: Moments, skewness and Kurtosis - Probability distributions: Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions, Correlation and regression – Rank correlation.

Module 6 : Applied Statistics and Sampling (06 hours)

Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves. Test of significance: Large sample test for single proportion, difference of proportions, Tests for single mean, t-distribution for dependent and independent samples, difference of means, and difference of standard deviations. Test for ratio of variances - Chi-square test for goodness of fit and independence of attributes.

Course Outcomes:

Upon completion of this course, students will be able

1. To solve field problems in engineering involving ODEs & PDEs.
2. Demonstrate the ability of using Transforms (Laplace, Fourier, Z, and Wavelet) in solving the Ordinary Differential Equations and Partial Differential Equations.
3. Solve the Ordinary and Partial Differential Equations using Transformation.
4. Identify the applicability of statistics and distribution of data.
5. Apply the concept of probability distribution to engineering problems.
6. Illustrate basic theory of correlations and regressionand sampling theory.

Textbooks/References:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, John Wiley & Sons, 2015.
2. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2017.
3. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 44th Edition, 2017.
4. Veerarajan T., Engineering Mathematics, Tata McGraw-Hill, New Delhi.
5. Dr. J Ravichandran , Probability and Statistics for Engineering, Wiley-India.
6. Hira & Gupta, Operation Research, S Chand.
7. P. G. Hoel, S. C. Port and C. J. Stone, "Introduction to Probability Theory", Universal Book Stall, 2003.
8. S. Ross, "A First Course in Probability", Pearson Education India, 2002.
9. W. Feller, "An Introduction to Probability Theory and its Applications", Vol. 1, Wiley, 1968.
10. Dr. M. Mazhar-ul-haque, Engineering Mathematics for Electrical Engineering, 2019.

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BSC- 406. Biology - I

Category	Code	Course Title	L	T	P	CR	PR	OR	TW	MSE	ESE	Total Mark
Basic Science Courses	BSC-406	Biology-I	2	0	0	2	-	25@	25	-	-	50

Course Objective:-

1. To understand the concept of modern biology.
2. To make the student fit for multi-disciplinary field (engineering and biology)
3. To make students aware of application of engineering principles in biology
4. Engineers should inspired by biological aspects.

Module 1: Introduction

(a) Biology & various terms used in Biology like ,Botany,Zoology, Microbiology, Biomedical Sciences, Bioinformatics,Anatomy,Physiology.

(b) Body Organisation

Various structure & classification with function of Cell,Tissue,Organ,System & Body.

(c) Evolution of life (Darwin's Theory)

Micro-organisms & Macro-organisms.

Module 2: Sensory system

(a) Taste, smell, Hearing,Vision,Touch.

(b) Strucure & function of each sensory organ

Tongue,Nose,Ear,Eyes,Skin.

(c) Reflexaction .

Module 3: Immunology

(a) Immune system

(b) Antigen-Antibody reaction

(c) Stem cells- degeneracy in Various system .

Module 4: Metabolism

(a) Kidney :- Structure & Function

(b) Liver :- Structure & Function

(c) Heart :- Structure & Function

(d) Energy yielding & emergency consuming reactions.

Module 5: Genetics :-

(a) Gene :- Structure & Function

(b) Newton's law

(c) Mendel's law

(d) concepts of segration & independant assortment

(e) concepts of allele

Course Outcomes :-

After studying the Course, the students will be able to,

1. Understand the body sensory system
2. Understand the body Immunology
3. Understand the body Metabolism Functions
4. Understand the Genetics

References:

1) Biology : A global approach : Campbell, N.A.; Reece, J.B.: Urry, Lisa: Cain,M,L.; wasserman, S. A.; Minorsky,P. V.; Jackson,R.B.:Pearson Education Lt

2) Anatomy and Physiology,Ross and Wilson,Churchill Livingstone

3) Principals Of Biochemistry (V Edition), By Nelson,D. L.: and Cox, M.M.W.H. Freeman and Company

4) Molecular Genetics (second edition) ,Stent,G.S.; and Calender, R.W.H.Freeman and Company, Distriuted by Satish Kumar Jain for CBS Publisher

5) Microbiology ,Prescott,L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers

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MC- 407. Seminar - II

Category	Code	Course Title	L	T	P	CR	PR	OR	TW	MSE	ESE	Total Mark
Mandatory Courses	MC 407	Seminar-II	0	0	2	1	0	25@	0	0	0	25

Note: - Seminar delivered on any relevant topics of fourth semester or on recent technologies in the field.

Every individual student shall work on a recent topic selected or assigned from any engineering/allied/applied fields for the seminar of academic or industrial interest. It is expected that the student has to collect information on a topic which is allotted by the Guide or not covered in curriculum of the under graduate course. Student has to refer hand book, research journals, reference books, proceeding of conference through library or internet and record of references considered for seminar is to preserved in hard copy or soft copy, which shall be produced at the time of seminar.

The report of seminar should be submitted in printed volume duly certified by guide, HOD and Principal in prescribed format given below. The student should deliver a seminar talk at least for **20 minutes** based on the work done by him/her. The performance will be judged by his guide and another expert appointed by HOD.

INSTRUCTIONS TO PREPARE REPORT AND PPT:-

1. Seminar report shall be typed on A-4 size white bond paper.

2. Typing shall be with line spacing of 1.5using black inkjet print on one side of the paper.

3. Margins

- Left 37.5mm
- Right, Top and Bottom 25mm.

4. Page number - At the bottom center aligned 12 point font size.

5. Header and Footer (12 point font size - Times New Roman)

- Header - Right side at top stating title of the seminar.
- Footer - Right side at bottom stating institute name.

6. Font

- Main title font - 14 point - bold - Times New Roman - Upper case
- Sub title font - 12 point - bold - Times New Roman - Title case
- Text font - 12 point - normal - Times New Roman - Running d) Graph / Figure / Table
- titles - 12 point - normal - Times New Roman - Title case .

7. Graph / Figure / Table: - shall be located at the center along with its title and Graph No. / Figure No. / Table No. If Graph / Figure / Table or any information is copied from any of the references, reference no. is to be shown at the end of its title / statement in square bracket superscripted form

8. Seminar report shall consists of at least following contents

- First page.
- Certificate.
- Acknowledgement.
- Index page (Chapter wise)
- Graph index (Graph no., Title, Page no.)
- Figure index (Figure no., Title, Page no.)
- Table index (Table no., Title, Page no.)
- Introduction /Abstract of seminar.
- Literature review.
- Core content of seminar.
- Merits and demerits of subject.
- Future scope.
- Conclusion.
- References.
- Appendix
- Compact Disc.

9. Format of seminar report:-

a. First page (Title page) and cover of seminar report.

(Institute logo)

Seminar Report on

“Title of Seminar”

By Name of student

Submitted in partial fulfillment of the requirement for the degree of

Bachelor of Engineering (Electrical)

Guide Head of Department Principal

(Name) (Name) (Name)

Department of Electrical Engineering

Name of Institute

Year.

c. Acknowledgement:- Acknowledgement shall consists of students opinion related to the seminar topic and his gratitude towards his guide, other staff, social members and his friends those who have really helped him to complete seminar report.

d. Chapter Index: - Shall have title as “INDEX” in bold - 14 point aligned at top center and page consisting of table with three columns as Chapter No., Chapter particulars, and Page No. Chapter No. and Page No shall be aligned at center of cell and chapter particulars left aligned in the cell.

e. Graph Index / Figure Index / Table Index: - Shall have title as “GRAPH INDEX / FIGURE INDEX / TABLE INDEX” in bold - 14 point center aligned at top of page. Page consisting of three column table as Graph No. / Figure No. / Table No. in first column, Title of Graph / Figure / Table in second column and Page No. in third column. (Similar to chapter index.)

10. Sketches:-Shall be drawn on separate sheet, center aligned with Figure No. and Title of sketch at its bottom.

11. Table shall preferably be typed in text format only with table no. and its title at the top, centrally aligned.

12. Standard mathematical symbols and notations shall be used.

13. The last item on Index should be references.

14. Compact Disc (C.D.) consisting of soft copy of seminar report, PPT, and supporting literature shall be affixed at back cover of report.

15. Presentation shall be made with help of Power point.

- Preferably each slide shall have plain white or faint yellow or navy blue or maroon colored back ground with contrast matching font.
- Each slide shall be numbered and header - footer shall be added similar to report.
- Figure / Graph / Table shall be labeled with Figure No. / Graph No. / Table No. and with reference nos. shown in seminar report
- Only brief points are to be highlighted on slides
- Information copied from references shall be numbered with reference number.
- Points are not to be read directly from slide at the time of presentation.
- Presentation shall be based on Figure, Graph, Table, Charts and points etc.
- First slide shall be identical to cover page of report.
- Second slide should contain introduction / abstract of seminar and content of presentation with bullets.
- Third slide shall focus on literature review.
- Fourth slide on wards core content of presentation shall be discussed.
- Slides at the end shall consist of merits, demerits, future scope, conclusion and references.

The oral marks for seminar will be allotted based on the following

1. Seminar Report 05 Marks

2. Literature Review 05 Marks

3. Technical Content 05 Marks

4. Presentation Skill (Aids used) 05 Marks

5. Question Answer 05 Marks

Total **25** Marks