Semester I (First year)

111	Linear Algebra, Differential Equations and Calculus	3	-	-	3	BSC

Course Objectives:

To equip the students with standard concepts and tools at an intermediate to advanced level mathematics to develop the confidence and ability among the students to handle various realworld problems and their applications.

Course Outcomes:

At the end of the course, the students will be able to

CO1: Solve given system of equations using rank method.

CO2: Compute eigen values and eigen vectors of a given matrix.

CO3:Examine given function of two variables for the extreme values using partial differentiation.

CO4: Determine the solution of a given first and higher order differential equations

CO-PO& PSO MATRIX:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3												3	
CO2	3												3	
CO3	3												3	
CO4	3												3	

Course Content:

UNIT-I **12 Periods**

Linear Algebra: Vector Space; Linear dependence and independence of vectors; Linear Transformations; Inner-products and norms. Rank of a matrix by echelon form, normal form. Consistency of system of linear equations-Homogeneous and Non-Homogeneous equations.

UNIT-II **12 Periods**

Eigen values, Eigenvectors of a matrix. Cayley-Hamilton Theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton Theorem. Reduction of Quadratic form to canonical form by Orthogonal Transformation. Properties of complex matrices - Hermitian, skew Hermitian and Unitary matrices.

UNIT-III **12 Periods**

Differential Calculus: Taylor's and Maclaurin's series expansion of functions of single variable. Partial differentiations, total differentiation, Euler's theorem, change of variables, Maxima and minima of two variables, Lagrange method of multipliers.

UNIT-IV **12 Periods**

Ordinary Differential Equations: Solution of first order ODE-exact equations and equations reducible to exact form, orthogonal trajectories. Higher order linear differential equations with constant coefficients-homogenous and non-homogenous: e^{ax}, $\sin(ax+b)$, $\cos(ax+b)$, Wronskian, Method of variation of parameters, Cauchy's differential equations.

Learning Resources:

Text Book:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 44th edition, 2017.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, 10th Edition, 2018.
2. R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics, Narosa Publishing House, 5th Edition 2016.

Web Resources:

1. http://nptel.iitm.ac.in/courses/

112	Engineering Physics	3	-	-	3	BSC

Course Objectives:

The main objectives of this course are to:

1. To understand the concept of wave and particle nature of matter and the basics of semiconductors.
2. Enlightening the modern optics such as lasers and optical fibers.
3. Identifying optoelectronic devices and low dimensional structures for various applications.
4. Explain the novel concepts of Sensors and its applications.

Course Outcomes:

At the end of the course, the student will be able:

1. Familiarize the Quantum Mechanical concepts, semiconductors and their uses.
2. Identify and illustrate types of lasers, optical fibers and their applications.
3. Demonstrate various optoelectronic devices, importance of low dimensional structures, their resistivity measurements.
4. Summarize various sensing technologies and their applications in computer science.

CO-PO Mapping:

(1-Low, 2-Medium, 3-High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	1				1			1
CO2	3	3	1	1	1				1			1
CO3	3	3	1	1	1				1			1
CO4	3	3	1	1	1				1			1

Course Content:

UNIT - I **CO1** **12 Periods**

Quantum Physics and Semiconductors :

Quantum Physics: Wave particle duality, debroglie's concept of matter waves, Davisson and Germer experiment, Heisenberg's uncertainty principle, experimental verification (diffraction- single slit), Schrodinger's time independent wave equation, Physical significance of ψ, particle in a one dimensional infinite potential well.

Semiconductors: Types of semiconductors: intrinsic and extrinsic semiconductors, temperature and concentration effects on fermi level (qualitative), Drift and diffusion currents, Formation of PN junction, Hall effect and its applications.

UNIT - II **CO2** **12 Periods**

Lasers and Fiber Optics:

Lasers: Interaction of radiation with matter, spontaneous and stimulated emissions, characteristics of lasers, basic requirements for the construction of lasers (Pumping, population inversion and optical resonant cavity), construction and working of He-Ne, Nd: YAG and semiconductor (GaAs) laser (Homo junction), applications of lasers.

Fiber optics: principle, basic structure, Numerical aperture & acceptance angle, classification (propagation of light in various fibers based on refractive index), Light wave communication through optical fibers, applications of optical fibers.

UNIT - III **CO3** **12 Periods**

Optoelectronic devices and Low dimensional structures:

Optoelectronic devices Direct & Indirect band gap Semiconductors, Photo diode, Light Emitting diode (LED) (construction & working), applications of LED, Solar cell (working principle and characteristics).

Low dimensional structures: Surface to volume ratio, Physical properties, classification of low dimension structures (quantum well, quantum wire and quantum dot), resistivity and its measurements by four point probe and vander pauv methods, hot-point probe method.

UNIT - IV **CO4** **12 Periods**

Introduction to Sensors and Sensing Technologies : Introduction, Human Body as a Sensor System, Passive and Active sensors, the sensor as part of a measurement system, sensor properties, Classification of Sensors: Piezoelectric Sensors (principle, mechanical force & pressure sensors), Thermal Sensors (metal & semiconductor based thermometers), Quantum Sensors (difference between classical & quantum sensors, over view of common types & applications).

Learning Resources:

Text Book:

1. A Text book of Engineering Physics, M. N. Avadhanulu, & TVS Arun Murthy, S. Chand Publications, 1st Edition 2024.
2. John Vetelino and Aravind Reghu, "Introduction to Sensors", CRC Press, 1st Edition, 2010.

Reference Book(s):

1. Engineering Physics, D.K.Bhattacharya & Poonam Tandon, Oxford
2. University Press, 2015.
3. B. K. Pandey, S. Chaturvedi .,"Engineering Physics" - Cengage Publications, 2012.
4. J. Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw-Hill Inc. (1995).
5. Hand book of Modern Sensors, Jacob Fraden, 4th edition, Springer, 2010.

Web Resources:

1. Online course: **Semiconductor Opto electronics** by M R Shenoy on NPTEL.
2. Online course : **Optoelectronic Materials and Devices** by Monica Katiyar and Deepak Gupta on NPTEL.
3. http://nptel.iitm.ac.in/courses/
4. *Course relevant website :* www.rvrjcce.ac.in/moodle

113	Basic Electrical and Electronics Engineering	3	-	-	3	BSC

Course Objectives:

The main objectives of this course are

1. To introduce fundamental laws, basic electrical elements, sources and their characteristics.
2. To develop the ability to apply circuit analysis to AC circuits.
3. To know the principle of operation and characteristics of Diode and transistors.
4. To acquire knowledge on feedback topologies and oscillators.

Course Outcomes:

After successful completion of the course, students will be able to:

1. CO1. Describe fundamentals of electrical and electronics circuits. (L1)
2. CO2. Demonstrate the concepts of electrical and electronics circuits. (L2)
3. CO3. Apply mathematical tools and fundamental concepts to derive various equations related to electrical and electronics circuits. (L3)
4. CO4. Calculate and solve the problems of electrical and electronics circuits. (L4)

CO – PO Mapping :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2									3
CO2	3	2	2									3
CO3	3	3	2	2								3
CO4	3		3	3								3

Course Content:

UNIT – I **Text Books– 1&2** **12 Periods**

Batteries: Lead-acid, Nickel-iron, Nickel-Cadmium batteries (Operation only).

DC Circuits: Electrical circuit elements (R, L and C), voltage and current sources- ideal and practical sources, Energy stored in inductor and capacitor, Kirchhoff current and voltage laws, Mesh and nodal analysis of simple dc circuits.

UNIT-II **Text Books – 1&2** **12 Periods**

Theorems to DC circuits: Superposition, Thevenin and Norton Theorems.

AC Circuits: Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference, average value, RMS value, form factor and peak factor. Analysis of single-phase ac

circuits consisting of R, L, C and their series combinations, real power, reactive power, apparent power, power factor.

UNIT - III **Text Book – 2** **12 Periods**

Semiconductor Diodes: Semiconductor diode, Zener diode, Half-Wave Rectifier, Full-Wave rectifier, Clippersand Clampers (no bias/reference voltage).

Bipolar Junction Transistor: Transistor operation, Common base configuration, Common emitter configuration, Common collector configuration.

UNIT – IV **Text Book –2** **12 Periods**

Amplifiers: Need of biasing, Types of biasing-fixed bias, collector base bias, self-bias.

Feedback and Oscillator Circuits: Feedback concepts, types of Feedback, Barkhausen criteria, RC Phase-Shift oscillator, Hartley oscillator, Colpitts oscillator.

Learning Resources:

Text Books:

1. A.Sudhakar and Shyam Mohan SP, "Circuits and Networks: Analysis and Synthesis", 5thEdition, TMH, 2017.
2. T.K.Nagasarkar andM.S.Sukhija, "Basic Electrical & Electronics Engineering", 3rd Edition Oxford press, 2017.

Reference Books:

1. V.K. Mehta, "Principles of Electrical Engineering and Electronics", S.Chand, 2019.
2. MahmoodNahvi and Joseph Edminister, Electric Circuits, 5th Edition, Schaum's outline series, TMH, 2017.
3. S.Salivahanan, A.Vallavaraj, "Electronic Devices and Circuits", TMH, 2011.
4. Robert Boylestad, Louis Nashelsky, "Electronic Devices and Circuit Theory", 10th Edition, Pearson, 2010.

Web Resources:

1. https://nptel.ac.in/courses/108105053
2. https://nptel.ac.in/courses/108108076
3. https://nptel.ac.in/courses/108101091

114	Programming for Problem Solving	4	-	-	4	ES

Course Objectives:

At the end of the course, the student will understand the

1. Basic problem solving process using Flow Charts and algorithms.
2. Basic concepts of control structures in C.
3. Concepts of arrays, functions, pointers and Dynamic memory allocation in C.
4. Concepts of structures, unions, files and command line arguments in C.

Course Outcomes:

At the end of the course, the student will be able to

1. Illustrate flow charts and algorithms for simple problems.
2. Choose suitable control structures for developing code in C.
3. Apply modular programming concepts for developing code in C.
4. Develop code for complex applications.

Course Content:

UNIT–I **15 Periods**

Introductory Concepts: Block Diagram of Computer, Computer Characteristics, Hardware vs Software, how to Develop a Program, Structured Programming, Types of Programming Languages. Introduction to C program, Program Characteristics.

Introduction to C Programming: Character set, Identifiers and Keywords, Data types, Constants, type qualifiers, Declaration and Initialization of variables.

Operators & Expressions: Arithmetic Operators, Unary Operators, Relational and Logical Operators, Assignment Operators, Conditional Operator, Data Input and Output.

UNIT–II **15 Periods**

Control Statements: Branching, Looping, Nested Control Structures, Switch Statement, Break Statement, continue Statement, and Goto Statement.

Arrays: Defining an Array, Processing an Array, Multidimensional Arrays & Strings.

UNIT–III **15 Periods**

Functions: Defining a Function, Accessing a Function, Function prototypes, Passing Arguments to a Function, Passing Arrays to Functions, Recursion, Storage Classes

Pointers: Fundamentals, Pointer Declarations, Passing Pointers to a Function, Pointers and Arrays, Dynamic memory allocation, Operations on Pointers, Pointers and Multi Dimensional Arrays, Arrays of Pointers.

UNIT – IV **15 Periods**

Structures and Unions: Defining a Structure, Processing a Structure, User-Defined Data Types, Structures and Pointers, Passing Structures to Functions, Self-Referential Structures, Unions.

File Handling: Opening and Closing a Data File, Reading and Writing a Data File, Processing a Data File, Unformatted Data Files, Accessing the File Randomly. Command line arguments, The C-preprocessor.

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Learning Resources:

Textbooks:

1. Programming with C (Schaum's Outlines) by Byron Gottfried, Third Edition, Tata McGraw-Hill.

Reference Books:

1. Programming in C by Stephen G. Kochan, Fourth Edition, Pearson
2. C Complete Reference, Herbert Sheildt, TMH., 2000.
3. Programming with C by K R Venugopal & Sudeep R Prasad, TMH., 1997.
4. The C programming Language by Brian W. Kernighan & Dennis M. Ritchie, Second Edition, Prentice Hall.
5. A Structured Programming Approach Using C by Behrouz A.Forouzan, Richard F.Gilberg, Third Edition, Cengage 2007.

WEB RESOURCES:

1. http://cprogramminglanguage.net/
2. http://lectures-c.blogspot.com/
3. http://www.coronadoenterprises.com/tutorials/c/c_intro.htm
4. http://vfu.bg/en/e-Learning/Computer-Basics--computer_basics2.pdf

151	Engineering Physics Lab	-	-	2	1	BSC

Course Objectives:

The main objectives of this course are to:

1. To familiarize the experiments to verify physics concepts such as interference, diffraction on light matter interaction.
2. To perform experiments to estimate the materials properties and to check their stability in science and engineering.
3. To analyze physics concepts and to design/problem solving skills, experimental set up for better and accurate measurements.
4. To understand and apply knowledge to measure and verify the values of certain constants in physics.

Course Outcomes:

On completion of this course, the student will be able to:

1. Demonstrate the principle of interference, diffraction, light propagation in optical fibers and light matter interaction using lasers and conventional light sources.
2. Calibrate and operate Function generator, CRO for making measurements.
3. Acquire knowledge of electricity, magnetism and mechanics to estimate fundamental constants in physics.
4. Draw conclusions from data and develop skills in experimental design.

List of Experiments:

1. Lissajous' Figures - Calibration of a given audio oscillator.
2. Determination of A.C. supply frequency using Sonometer.
3. Variation of magnetic field along the axis of a circular current carrying coil.
4. Determination of Quality factor of a given Series resonance LCR circuit.
5. Characteristic curves of a given Photocell and measurement of Stopping Potential.
6. Determination of Fill factor of a given Photovoltaic cell.
7. Calculation of radius of curvature of a given Plano-convex lens by Newton's Rings experiment.
8. Determination of wavelength of a given laser source using diffraction grating.
9. Determination of Young's Modulus of a material – Non Uniform Bending.
10. Determination of Rigidity modulus of a wire using Torsional pendulum
11. Compound Pendulum – Determination of Acceleration due to Gravity.
12. Determination of Acceptance angle and Numerical Aperture (NA) of a given optical fiber.
13. Measurement of resistivity and energy band gap of a Semiconductor using Four-Probe method.
14. Interference fringes – Measurement of thickness of a given paper foil – wedge method.

Note: A minimum of 10(Ten) experiments have to be performed and recorded by the candidate to attain eligibility for Semester End Practical Examination.

Learning Resources:

Reference Books:

1. Physics Lab Manual: **RVR & JCCE**, Guntur.
2. Engineering Physics Lab Manual, **Dr. C.V.Madhusudhana Rao, V. Vasanth Kumar** 3rd edition, Scitech publications(India) Pvt. Ltd. Chennai.
3. Engineering Physics Practicals, **Dr.B. Srinivasa Rao, V.K.V.Krishna, K.S.Rudramamba,** University Science Press, Daryaganj, NewDelhi.

CO-PO-PSO Mapping:

(1-L-Low, 2-M-Medium, 3-H-High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1
CO1	3	3	2	1	1				2			1	2
CO2	3	3	2	1	1				2			1	2
CO3	3	3	2	1	1				2			1	2
CO4	3	3	2	1	1				2			1	2

152	Basic Electrical and Electronics Engineering Lab	-	-	2	1	ES

Course Objectives:

The main objectives of this lab course are

1. To conduct experiments on electrical circuits and theorems.
2. To learn Diode characteristics, and basic diode applications as rectifiers and regulators.
3. To learn BJT characteristics and Oscillators.

Course Outcomes:

After successful completion of the course, students will be able to:

1. CO1: Identify & testing of various electrical and electronic components and measuring instruments.
2. CO2: Verification of fundamental laws and determination of parameters of electrical systems.
3. CO3: Verification of the network theorems.
4. CO4: Plot and discuss the characteristics of various electronics devices.

CO-PO Mapping Table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2									3
CO2	3	2	2									3
CO3	3	3	2	2								3
CO4	3		3	3								3

List of experiments/demonstrations:

1. Basic safety precautions. Introduction and use of measuring instruments –voltmeter, ammeter, wattmeter, multi-meter, oscilloscope, Power Supplies, Familiarization of Electrical Installations and Electrical Testing Equipment: Fuses, Types of Wires, Wire Gauges, continuity test.
2. Familiarization/Identification of components (Resistors, Capacitors, Inductors, Diodes, transistors, Bread board etc.) – Functionality, type, size, colour coding package, symbols.
3. Verification of KVL and KCL.
4. Verification of Superposition Theorem.
5. Verification of Thevenin's Theorem.
6. Verification of Norton's Theorem.
7. Determination of choke coil parameters.
8. Characteristics of Silicon, Germanium diodes.
9. Characteristics of Zener diode.
10. Half Wave Rectifier and Full Wave Rectifier.

11. Transistor Characteristics in CE configuration.
12. Characteristics of FET.
13. Self-Bias circuit.
14. Hartley oscillator.
15. Colpitt's Oscillator.

Note: A minimum of 10(Ten) experiments have to be Performed and recorded by the candidate to attain eligibility for Semester End Practical Examination.

153	Programming for Problem Solving Lab	-	-	3	1.5	ES

Course Objectives:

The objectives of the course are, to make the student understand:

1. Basic problem solving process using Flow Charts and algorithms.
2. Basic concepts of control structures in C.
3. Concepts of arrays, functions, pointers and Dynamic memory allocation in C.
4. Concepts of structures, unions, files and command line arguments in C.

Course Outcomes:

After successful completion of the course, the students are able to

1. Read, understand and trace the execution of programs written in C language.
2. Write the C code for a given algorithm.
3. Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
4. Write programs that perform operations using derived data types.

List of Exercises / Activities:

[The laboratory should be preceded or followed by a tutorial to explain the approach or algorithm to be implemented for the problem given.]

Lab1 Simple computational problems using arithmetic expressions.
Lab2 Problems involving if-then-else & switch.
Lab3 Iterative problems.
Lab4 1D Array manipulation.
Lab5 Problems on 2D arrays and Strings.
Lab6 Function calling mechanisms (Call by value).
Lab7 Function calling mechanisms (Call by reference).
Lab8 Recursive functions.
Lab9 Dynamic memory allocation.
Lab10 Structures and unions.
Lab11 File operations.
Lab12 Command line arguments.

Note: A minimum of 10(Ten) experiments have to be Performed and recorded by the candidate to attain eligibility for Semester End Practical Examination.

154	Engineering Graphics	1	-	2	2	ES

Course Objectives:

1. To learn basic engineering graphic communication skills & concept.
2. To apply basic concept to draw, edit, dimension, hatching etc. to develop 2D& 3D Modelling.
3. To gain the capability of designing 3D objects with isometric principles by usingcomputer aided sketches
4. To know the conversion of Orthographic Views to isometric Views andisometric to Orthographic views

Course Outcomes:

After successful completion of the course, the students are able to

1. Demonstrate basic concepts of the AutoCAD software and apply basic conceptsto develop construction (drawing) techniques
2. Understand and demonstrate dimensioning concepts and techniques
3. Manipulate drawings through editing and plotting techniques
4. Produce 2D Orthographic Projections and 3D isometric views
5. Become familiar with Solid Modeling concepts and conversion of isometric toorthographic views

CO – PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3		2				2	3		1		
CO2	3	3	3		2				2	3		1		
CO3	3	3	3		2				2	3		1		
CO4	3	3	3		2				2	3		1		
CO5	3	3	3		2				2	3		1		

Course Content:

- Week 1: Introduction to Engineering graphics, Drawing Instruments and their uses, BIS conventions, lettering, Dimensioning & free hand practicing. Introduction to AUTOCAD software, importance, environment settings
- Week 2: Introduction to Draw toolbar
- Week 3: Introduction to Modify toolbar
- Week 4: Introduction to conics-I: Ellipse General method
- Week 5: Introduction to conics-II: Ellipse-Oblong and concentric circle method

- Week 6: Introduction to engineering curves-I: Cycloid.
- Week 7: Introduction to engineering curves-II: Epicycloid, Hypocycloid, involute
- Week 8: 2D Sketches of Mechanical Components practice -I
- Week 9: 2D Sketches of Mechanical Components practice -II
- Week 10: Introduction to isometric views-importance-Environment settings
- Week 11: Practice of Isometric views for various mechanical components
- Week 12: Introduction to 3D tool bars in AUTOCAD
- Week 13: 3D modelling of basic components / castings
- Week 14: Conversion of Isometric Views to Orthographic Views

Learning Resources:

Text Books:

1. Engineering Drawing, N. D. Butt, Chariot Publications
2. "Engineering Graphics with AUTOCAD", Dhanunajy M. Kulakarni, A.P.Rastogl, Ashoke K. Sarkar, 2009, PHI Learning Private Ltd., New Delhi

Reference Books:

1. ComputerAided Engineering Drawing – S. Trymbaka Murthy, - I.K. International Publishing House Pvt. Ltd., New Delhi, 3rd revised edition-2006.
2. Engineering Graphics - K.R. Gopalkrishna, 32nd edition, 2005- SubashPublishers Bangalore.

155	NSS/NCC/ Community Service	-	-	1	0.5	BS&H

Course Objectives:

The objective of introducing this course is to impart discipline, character, fraternity, team work, social consciousness among the students and engaging them in selfless service.

Course Outcomes: After completion of the course the students will be able to

CO1: Understand the importance of discipline, character and service motto.

CO2: Solve some societal issues by applying acquired knowledge, facts, and techniques.
CO3: Explore human relationships by analyzing social problems.
CO4: Determine to extend their help for the fellow beings and downtrodden people.
CO5: Develop leadership skills and civic responsibilities.

UNITI Orientation

General Orientation on NSS/NCC/ Scouts & Guides/Community Service activities, career guidance.

Activities:

i) Conducting–ice breaking sessions-expectations from the course-knowing personal talents and skills
ii) Conducting orientations programs for the students–future plans-activities-releasing road map etc.
iii) Displaying success stories-motivational biopics- award winning movies on societal issues etc.
iv) Conducting talent show in singing patriotic songs-paintings-any other contribution.

UNITII Nature & Care Activities:

i) Best out of waste competition.
ii) Poster and signs making competition to spread environmental awareness.
iii) Recycling and environmental pollution article writing competition.
iv) Organizing Zero-waste day.
v) Digital Environmental awareness activity via various social media platforms.
vi) Virtual demonstration of different eco-friendly approaches for sustainable living.
vii) Write a summary on any book related to environmental issues.

UNITIII Community Service Activities:

i) Conducting One Day Special Campina village contacting village-area leaders-Survey in the village, identification of problems- helping them to solve via media- authorities-experts-etc.
ii) Conducting awareness programs on Health-related issues such as General Health, Mental health, Spiritual Health, HIV/AIDS,
iii) Conducting consumer Awareness. Explaining various legal provisions etc.
iv) Women Empowerment Programs Sexual Abuse, Adolescent Health and Population Education.
v) Any other programs in collaboration with local charities,NGOs etc.

Reference Books:

1. Nirmalya Kumar Sinha & Surajit Majumder, *A Text Book of National Service Scheme* Vol;.I,Vidya Kutir Publication, 2021(ISBN978-81-952368-8-6)
2. *RedBook- National Cadt Corps*–Standing Instructions Vol I&II, Directorate General of NCC, Ministry of Defence, NewDelhi
3. Davis M.L. and Cornwell D.A.,"Introduction to Environmental Engineering", McGraw Hill, New York4/e 2008
4. Masters G.M., Joseph K. and Nagendran R."Introduction to Environmental Engineering and Science", Pearson Education, New Delhi. 2/e2007
5. Ram Ahuja. *Social Problems in India*, RawatPublications,NewDelhi.

General Guidelines:

1. Institutes must assign slots in the Time table for the activities.
2. Institutes are required to provide instructor to ment or the students.

Evaluation Guidelines:

- Evaluated for a total of 100marks.
- A student can select 6 activities of his/her choice with a minimum of 01 activity per unit. Each activity shall be evaluated by the concerned teacher for 15 marks, totaling to 90marks.
- A student shall be evaluated by the concerned teacher for 10 marks by conducting viva voce on the subject.