Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

ML307 ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY

SUBJECT CODE	CATEGORY	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
ML-307	Compulsory	Environmental Management and Sustainability	60	20	20	0	0	4	0	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;

***Teacher's Assessment** shall be based upon following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives

1. To create awareness towards various environmental problems.
2. To create awareness among students towards issues of sustainable development.
3. To expose students towards environment friendly practices of organizations.
4. To sensitize students to act responsibly towards environment.

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of five questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

Course Outcomes

1. The course will give students an overview of various environmental concerns and practical challenges in environmental management and sustainability.
2. Emphasis is given to make students practice environment friendly behavior in day-to-day activities.

COURSE CONTENT

Unit I: Introduction to Environment Pollution and Control

1. Pollution and its types (Air, Water, and Soil): Causes, Effects and Control measures
2. Municipal Solid Waste: Definition, Composition, Effects
3. Electronic Waste: Definition, Composition, Effects
4. Plastic Pollution: Causes, Effects and Control Measures

Unit II: Climate Change and Environmental Challenges

1. Global Warming and Green House Effect
2. Depletion of the Ozone Layer
3. Acid Rain
4. Nuclear Hazards

Unit III: Environmental Management and Sustainable Development

1. Environmental Management and Sustainable Development: An overview
2. Sustainable Development Goals (17 SDGs)
3. Significance of Sustainable Development
4. Environment Friendly Practices At Workplace and Home (Three Rs' of Waste Management, Water Conservation, Energy Conservation)

Unit 1V: Environmental Acts

1. The Water (Prevention and Control of Pollution) Act, 1974: Objectives, Definition of Pollution under this act, Powers and Functions of Boards
2. The Air (Prevention and Control of Pollution) Act, 1981: Objectives, Definition of Pollution under this act, Powers and Functions of Boards
3. The Environment (Protection) Act, 1986: Objectives, Definition of important terms used in this Act, Details about the act.
4. Environmental Impact Assessment: Concept and Benefits

Unit V: Role of Individuals, Corporate and Society

1. Environmental Values
2. Positive and Adverse Impact of Technological Developments on Society and Environment
3. Role of an individual/ Corporate/ Society in environmental conservation
4. Case Studies**:** The Bhopal Gas Tragedy, New Delhi's Air Pollution, Arsenic Pollution in Ground Water (West Bengal), Narmada Valley Project, Cauvery Water Dispute, Fukushima Daiichi Disaster (Japan), Ozone Hole over Antarctica, Ganga Pollution, Deterioration of Taj Mahal, Uttarakhand flash floods

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

DEGREE PROGRAM

B.Sc III Sem

SUBJECT CODE	Category	SUBJECT NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment *	End Sem University Exam	Teachers Assessment*				
BSPH302	DC	Electronics: Principles and Devices	60	20	20	30	20	3	1	4	6

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
Q/A – Quiz/Assignment/Attendance, MST MidSem Test.
*Teacher Assessment shall be based on following components: Quiz/Assignment/ Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Objectives:-

1. To develop the comprehensive understanding of laws of physics related toElectronics: Principles and Devicesand ability to apply them for laying the foundation for research and development.
2. To work ethically as member as well as leader in a diverse team.

Course Outcomes:-

1. Student will be able to understand and solve the problems related toElectronics: Principles and Devices,
2. Student will be able to determine physical parameter experimentally with optimal usage of resources and complete the assignments in time.

BSPH 302- Electronics: Principles and Devices

Unit 1:-

Classical FE Model, Debye Model, Summer Field FE Model, Band Model, Kronig-Penney Model, Effective Mass, Formulation of Energy Bands, Gap in Solids, Motion of e^- in Metals, Density of States, Fermi Level, Fermi Velocity and Fermi Dirac Distribution of e^- Inside a Matter.

Unit-2

Semiconductors; Intrinsic-semiconductors, electrons and holes, Fermi Level, Temperature dependence of electron and hole concentrations Doping: impurity states, n and p type semiconductors, conductivity, mobility, Hall Effect, Hall Coefficient. Semiconductor devices: Metal-semiconductor junction, p-n junction, majority and minority carriers,

Unit-3

Zener and tunnel diodes, light emitting diode, solar cell Diode as a circuit element, load line concept, rectification, ripple & factor, Zener diode, voltage stabilization, IC voltage regulation. FETs: Field effect transistorsJEET, BJT, MOSFET, Transistors, Characteristics of a transistor in CB, CE and CC mode, h-parameters,

Unit-4

Amplifiers,Small signal amplifiers; General Principle of operation, classification, distortion, RC coupled amplifier, gain frequency response, input and output impedance, multistage amplifiers.Transformer coupled amplifiers, Equivalent circuits at low, medium and high frequencies, emitter follower, low frequency common source and common drain amplifier, Noise in electronic circuits.

Unit-5

Oscillators, Feedback in amplifiers, principle, its effects on amplifiers, characteristicsPrinciple of feedback amplifier,,Barkhausen criteria, Hartley, Colpitt and Wein bridge oscillators.Condition for oscillations and frequency derivation - Crystal oscillator - UJT Relaxation oscillator.Monostable, Bi-stable and Astable multivibrators

References:

1. Introduction to Solid State Physics C. Kittel
2. Solid State Physics : R.L, Singhal
3. Micro Electronics J- Millman and A. Grabel
4. Electronic Devices and Circuits : MillmanHalkias
5. Electronic Devices Circuits and Applications : J.D. Ryder
6. Electronic Devices and Circuits: Robert Baylested and Louis Nashelsky

List of Experiments (Any Eight)

1. Find V-I characteristics of PN Junction Diode.
2. To Find V-I characteristics of Zener Diode
3. To Find V-I characteristics of Tunnel Diode
4. To Find V-I characteristics of Photo Diode
5. To find Input/output characteristics of common base PNP/NPN transistor.
6. To find Input/output characteristics of common emitter PNP/NPN transistor.
7. Determination of Energy band gap (E_g) using PN Junction Diode.
8. Study of regulated power supply.
9. Determination of Energy band gap 'E_g' of Ge using Four Probe method.
10. To Study Frequency of Hartley oscillator
11. To Study Frequency of Wein bridge oscillator
12. Study of RC coupled amplifiers

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Name of the Program: B. Sc. (Plain)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMA 304	DC	Integral Calculus	60	20	20	-	-	3	1	-	4

Course Objective

To introduce the students with the Fundamentals of the Integral Calculus.

Course Outcomes

After the successful completion of this course students will be able to

1. *evaluate some standard integrals.*
2. *know and apply various properties of the Definite Integral.*
3. *find length, surface area and the volume by single and the multiple integrals.*

Course Content:

UNIT – I

Integration: Integration of the form : $\int \frac{dx}{a\cos x + b\sin x + c}$, $\int \frac{a\cos x + b\sin x + c}{p\cos x + q\sin x + r} dx$ and Integration of Rational functions, six important integral, Reduction formulae of $\int \sin^m x \cos^n x\, dx$, $\int (\sin^m x/\cos^n x)dx$, $\int \tan^n x\, dx$ and associated problems (m and n are non-negative integers).

UNIT – II

Definite Integral: Evaluation of definite integrals, Properties of integral Calculus, Integration as the limit of a sum (with equally spaced as well as unequal intervals), summation of series.

UNIT – III

Definition of Improper Integrals: Statements of (i) μ -test, (ii) Comparison test (Limit form excluded) – Simple problems only. Use of Beta and Gamma functions (convergence and important relations being assumed).

UNIT – IV

Rectification: Length of Plane Curve, Intrinsic Equation of a Curve, Quadrature, Working knowledge of Double integral, Application of Double integral, Change Order of integration.

UNIT – V

Volume and Surfaces of Revolution: Volume and Surface areas of solids formed by revolution of plane curve and areas Problems only.

Texts:

1 Integral Calculus – Shanti Narayan & P. K. Mittal (S. Chand & Co. Ltd.)

2 Integral Calculus – H. S. Dhami (New Age International)

3 Integral Calculus – B. C. Das & B. N. Mukherjee (U. N. Dhur)

4 Differential & Integral Calculus (Vols. I & II) – Courant & John.

5 Differential & Integral Calculus (Vol. I) – N. Piskunov (CBS Publishers & Distributors)

6. Integral Calculus – Shantinarayan.

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ShriVaishnav Institute of Computer Applications

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSCS304	COMPULSORY	Fundamentals of Data Structure	60	20	20			3	1	0	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

***Teacher Assessment** shall be based on following components:
Quiz/Assignment/project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Educational Objectives(CEOs):

- To understand the students with the applications of Standard data structure in real world problems.
- To provide knowledge of creation of new data structures.
- To familiarize the students with the analysis and design a particular problem.

Course Outcomes (Cos):students will be able to

- Demonstrate familiarity with major algorithms and data structures.
- Analyze performance of algorithms.
- Choose the appropriate data structure and algorithm design method for a specified application.
- Demonstrate understanding of the abstract properties of various data structures such as stacks, queues, lists, trees and graphs
- Demonstrate understanding of various sorting algorithms, including bubble sort, insertion sort, selection sort, heap sort and quick sort.
- Understand and apply fundamental algorithmic problems including Tree traversals, Graph traversals, and shortest paths.
- Demonstrate understanding of various searching algorithms.
- Program multiple file programs in a manner that allows for reusability of code.
- Compare different implementations of data structures and to recognize the advantages and disadvantages of the different implementations.

UNIT 1

Introduction and Overview: Introduction, Basic Terminology, Elementary Data Organization, Overview of Data Structures Types, Data Structure Operations, Algorithms: Complexity, Time-Space Tradeoff, Frequency count: Simple algorithms. Abstract data type (ADT), Fundamental and derived data types, Primitive data structures.

UNIT 2

Arrays: Definition, Terminology, One dimensional array: Memory allocation, Operations, Application, Multidimensional Arrays: Two dimensional Arrays, Sparse matrices, Three dimensional and n-dimensional Arrays, Pointer Arrays.

UNIT 3

Stacks: Introduction , Definition, Representation of stacks, Operations on stacks, Applications of stacks.
Linked List: Definition, Singly Linked List: Representation, Operations; Circular Linked List, Header Linked Lists, Doubly Linked List: Operations, Circular Doubly Linked List: Operations, Application of Linked Lists: Sparse Matrix Manipulation, Polynomial Representation; Dynamic Storage Management; Memory Representation: Fixed, Variable block storage, Deallocation Strategy.

UNIT 4

Queues: Introduction, Definition, Representation of Queues: Arrays Representation, Linked list Representation; Various Queue structures: Circular Queue, Deques, Priority Queue; Applications of Queues.
Trees: Concepts, Representation of Binary Trees in Memory, Operations on Binary Tree, Types of Binary Trees.
Graphs: Introduction, Graph terminologies, Sequential Representation of Graphs: Adjacency Matrix, Path Matrix; Adjacency List Representation, Shortest Path Algorithms: Dijkstra's Technique, Bellman-Ford Algorithm, Floyd-Warshall Algorithm; Minimum Spanning Tree Algorithms: Kruskal's Algorithm, Prim's Algorithm; Operations on Graphs, Traversing and Searching a Graph, Application of Graph Structures.

UNIT 5

Searching: Sequential and Binary Search, Indexed Search, Hashing Schemes, Hashing functions: Division/Remainder methods, Mid Square method, Folding method; Hash Collision: linear probing, Chaining, Bucketing.
Sorting: Selection sort, Bubble sort, Insertion sort, Quick sort, Merge sort, Radix sort, Shell sort, Heap sort, Comparison of time complexities.

TEXT BOOKS:

[T1] Seymour Lipschutz, Data Structures, *The**McGraw Hill** Companies*
[T2] Horowitz, Sahni, Anderson-Freed; Fundamentals of Data Structures in C; *Universities Press*

REFERENCE BOOKS:

[R1] NarasimhaKarumanchi, Data Structures and Algorithms Made Easy,*CareerMonk Publications*
[R2] Thomas H. Cormen , Charles E. Leiserson, Ronald L. Rivest, Clifford Stein; Introduction to Algorithms, *The MIT Press*
[R3] Debasis Samanta, Classic Data Structures, *Prentice Hall India*

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ShriVaishnav Institute of Computer Applications

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BSCL307	COMPULSORY	Data Structure Lab	0	0	0	30	20	0	0	4	2

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

***Teacher Assessment** shall be based on following components:
Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Learning Objectives (CEOs):

- To familiarize the students with programming and to encourage them to develop their logic.
- To make students well versed with C++ language to solve problems efficiently.
- Using simple and well drawn illustrations develop their programming skills using modular programming.

Course Outcomes (Cos): Student will be able to:

- Develop algorithms for problems.
- Apply the programming concepts to solve the given problems.
- Write the programs using modular programming.
- Understand and write programs using various data structures very efficiently.
- To choose a suitable data structure for a given problem.
- Write the programs using pointers and to manage memory.
- Implement programs of file handling.

Note: Program should be fully documented with sample I/O. Data Flow charts should be developed wherever necessary.

Write an Algorithm and Program using functions for:
1. Traversing the elements of an Array
2. Inserting an element in an Array
3. Deleting an element from an Array
4. Merging of two Arrays

5. Linear Search
6. Binary Search
7. Insertion Sort
8. Bubble Sort
9. Selection Sort
10. Implementing PUSH & POP operations of a Stack
11. Array Implementation of a Queue and Circular Queue
12. Converting infix notation into post fix notation
13. Insertion in single and double Linked List
14. Deletion from single and double Linked List

TEXT BOOKS:

[T1] Seymour Lipschutz, Data Structures, *The**McGraw Hill** Companies*
[T2] Horowitz, Sahni, Anderson-Freed; Fundamentals of Data Structures in C; *Universities Press*

REFERENCE BOOKS:

[R1] NarasimhaKarumanchi, Data Structures and Algorithms Made Easy,*CareerMonk Publications*
[R2] Thomas H. Cormen , Charles E. Leiserson, Ronald L. Rivest, Clifford Stein; Introduction to Algorithms, *The MIT Press*
[R3] DebasisSamanta, Classic Data Structures, *Prentice Hall India*

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Name of the Program: B. Sc. (Plain)

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
BSMA 305	DC	Differential Equations	60	20	20	-	-	3	1	-	4

Course Objective

To introduce the students with the Fundamentals of the Differential Equation. .

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Course Outcomes

After the successful completion of this course students will be able to

1. *solve first order and first degree differential equation.*
2. *find the solution of first order and higher degree differential equation.*
3. *apply the techniques of the orthogonal trajectories.*
4. *know the solution of the second order linear differential equation.*
5. *solve Euler's Homogeneous equations*.

Course Content:

UNIT – I

Differential equation of first degree and first order: Order, degree and solution of an ordinary differential equation (ODE) in presence of arbitrary constants, Formation of ODE,First order equations , Variables separable, Homogeneous equations and equations reducible to homogeneous forms , Exact equations and those reducible to such equation, Euler's and Bernoulli's equations (Linear).

UNIT – II

Equation of the first order but not of the first degree: Equation solvable for P, Equation solvable for X, Equation solvable for y, Clairaut's Equations (General and Singular solutions).

UNIT – III

Orthogonal Trajectories: Definition, Cartesian coordinates, polar coordinates, Self Orthogonal families.

UNIT – IV

Second order linear equations: Second order linear differential equations, with constant coefficients, operator, Rule of finding particular integral.

UNIT – V

Homogeneous equations: Euler's Homogeneous equations, Equation reducible to homogeneous form.

Texts:

1. Differential Equations – Lester R. Ford (McGraw Hill).
2. Differential Equations – S. L. Ross (John Wiley).
3. Differential Equations – H. T. H. Piaggio.
4. A Text Book of Ordinary Differential Equations – Kiseleyev, Makarenko & Krasnov (Mir).
5. Differential Equations – H. B. Phillips (John Wiley & Sons).
6. Differential Equations with Application & Programs – S. Balachanda Rao, H. R. Anuradha (University Press).
7. Text Book of Ordinary Differential Equations (2nd Ed.) – S. G. Deo, V. Lakshmikantham & V. Raghavendra (Tata McGraw Hill).
8. An Elementary Course in Partial Differential Equation – T. Amarnath (Narosa).
9. An Introductory Course on Ordinary Differential Equation – D. A. Murray