II B.TECH I SEMESTER SYLLABUS

PROBABILITY AND STATISTICS

II B. TECH- I SEMESTER

Course Code:	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
A5BS05	BSC	3	-	-	3	30	70	100

COURSE OBJECTIVES:

To learn

1. The concepts of discrete and continuous random variables, the probability distribution and density Function.
2. Evaluation of marginal and conditional distribution of multiple random variables.
3. The concept of correlation and regression to find covariance.
4. Evaluation of the given data for appropriate test of hypothesis.
5. Analyzing the data for variance.

COURSE OUTCOMES

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

1. Describe the continuous random variables and moments of Discrete and continuous random variables.
2. Calculate probabilities and derive the marginal and conditional distribution of bivariate random variables.
3. Apply the concept of correlation and regression to find covariance.
4. Evaluate the given data for appropriate test of hypothesis.
5. Test the data for analysis of variance.

UNIT - I	SINGLE RANDOM VARIABLES	CLASSES: 08

Basic definitions of probability- Random Variables – Discrete and Continuous. Probability distributions, mass function/ density function of a probability distribution, mathematical expectation, moments about origin, central moments, skewness, Kurtosis. Moment generating function of probability distribution.

UNIT - II	PROBABILITY DISTRIBUTIONS	CLASSES: 08

Binomial, Poisson, Normal, exponential and Gamma distributions -their Properties.
Moment generating functions of the above distributions and hence find the mean and variance.
Joint probability distributions- Joint probability mass /density function, Marginal probability, mass / density functions.

UNIT - III	CORRELATION & REGRESSIONSAMPLING DISTRIBUTIONS	CLASSES: 10

Coefficient of correlation, the rank correlation, Covariance of two random variables. Regression- Regression Coefficient, The lines of regression and multiple correlation & regression
Sampling: Definitions of population, sampling, statistic, parameter. Types of sampling, Expected values of Sample mean and variance, sampling distribution, Standard error, Sampling distribution of means and samplingdistribution of variance.
Parameter estimation- Point estimation and interval estimation

UNIT - IV	TESTING OF HYPOTHESIS - I	CLASSES: 10

Testing of hypothesis: Null hypothesis, Alternate hypothesis, Type I& Type II errors – critical region, confidenceinterval, Level of significance. One sided test, Two sided test.

Large sample tests:

(i) Test of Equality of means of two samples, equality of sample mean and population mean (cases of known variance & unknown variance, equal and unequal variances)

(ii) Tests of significance of difference between sample S.D and population S.D.

(iii) Tests of significance difference between sample proportion and population proportion, difference between two sample proportions.

UNIT - V	TESTING OF HYPOTHESIS-II	CLASSES: 06

Student t-distribution, its properties; Test of significance sample mean and population mean, difference between means of two small samples. Snedecor's F- distribution and its properties. Test of equality of two population variances. Chi-square distribution, its properties, Chi-square test of goodness of fit.

TEXT BOOKS:

1. B.S.Grewal, Higher Engineering Mathematics, Khanna publishers, 36th Edition, 2010.
2. Probability and Statistics for Engineers by Richard Arnold Johnson, Irwin Miller and John E. Freund, New Delhi, Prentice Hall.
3. Probability and Statistics for Engineers and Sciences by Jay L. Devore, Cengage Learning

REFERENCE BOOKS:

1. Ervin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. Fundamentals of Mathematical Statistics by S.C. Guptha &V.K. Kapoor, S. Chand
3. Introduction to Probability and Statistics for Engineers and Scientists by Sheldon M. Ross, Academic Press

WEB REFERENCES:

1. https://www.efunda.com/math/math_home/math.cfm
2. https://www.ocw.mit.edu/resources/#Mathematics
3. https://www.sosmath.com/
4. https://www.mathworld.wolfram.com/

E -TEXT BOOKS:

1. https://www.e-booksdirectory.com/details.php?ebook=10166
2. https://www.e-booksdirectory.com/details.php?ebook=10166

MOOCS COURSE:

1. https://swayam.gov.in/
2. https://onlinecourses.nptel.ac.in/

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DISCRETE MATHEMATICS

II B. TECH- I SEMESTER

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
A5BS16	BSC	3	1	-	4	30	70	100

COURSE OBJECTIVES:

The course should enable the students to:

1. To help students understand discrete and continuous mathematical structures
2. To impart basics of relations and functions
3. To facilitate students in applying principles of Recurrence Relations to calculate generating
4. Functions and solve the Recurrence relations
5. To acquire knowledge in graph theory

COURSE OUTCOMES:

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

1. Analyze and examine the validity of argument by using propositional and predicate calculus
2. Apply basic counting techniques to solve the combinatorial problems
3. Apply sets relations and digraphs to solve applied problems
4. Solve the given recurrence relation using different methods such as substitution, Generating function and characteristics roots equation.
5. Use the basic concepts of graph theory and some related theoretical problems

UNIT - I	MATHEMATICAL LOGIC	CLASSES: 11

Statements and notations, Connectives, Well formed formulas, Truth Tables, Tautology, Equivalence implication, Normal forms, Logical Inference, Rules of inference, Direct Method, Direct Method using CP(Conditional Proof), Consistency, Proof of contradiction, Automatic Theorem Proving.

UNIT - II	RELATIONS	CLASSES: 16

Introduction to set theory**,** Relations, Properties of Binary Relations, Equivalence Relation, Transitive closure, Compatibility and Partial ordering relations, Lattices, Hasse diagram. Functions: inverse Function , Composition of functions.

UNIT - III	ELEMENTARY COMBINATORICS	CLASSES: 12

Basis of counting, Combinations & Permutations, Enumeration of Combinations and Permutations, Enumeration of Combinations and Permutations With repetitions, Enumerating Permutations with Constrained repetitions, Binomial Coefficients, Binomial and Multinomial theorems, The principles of Inclusion – Exclusion, Pigeon- hole principles and its applications.

UNIT - IV	RECURRENCE RELATION	CLASSES: 11

Generating Functions, Function of Sequences, Calculating Coefficient of generating function, Recurrence relations, Solving recurrence relation by substitution and Generating functions , The method of Characteristics roots, Solution of Inhomogeneous Recurrence Relation.

UNIT - V	GRAPHS	CLASSES: 10

Basic Concepts, Isomorphism and Subgraphs, Trees and their properties, Spanning Trees- DFS,BFS, Minimal Spanning Trees- Prims, Kruskal's Algorithm, Planar Graphs, Euler's Formula, Multi graph and Euler circuits, Hamiltonian Graphs, Chromatic number.
TEXT BOOKS:
1. Discrete Mathematics for computer scientists & Mathematicians, *J.L. Mott, A. Kandel, T.P.* Baker PHI 2. Discrete Mathematical Structures With Applications to Computer Science, JP Tremblay, R Manohar
REFERENCE BOOKS:
1. Logic and Discrete Mathematics, *Grass Man & Trembley*, Pearson Education.

DIGITAL ELECTRONICS AND COMPUTER ORGANIZATION

II B. TECH- I SEMESTER

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
A5EC72	ESC	3	1	-	4	30	70	100

COURSE OBJECTIVES:

The course should enable the students to:

1. Understand different number systems.
2. Design combinational and sequential logic circuits
3. Understand concepts of register transfer logic and arithmetic operations.
4. Learn different types of addressing modes and memory organization

COURSE OUTCOMES:

1. Able to solve from one number to another number.
2. Able to combinational and sequential logic circuits
3. Identify basic components and design of the CPU: the ALU and control unit.
4. Compare various types of IO mapping techniques
5. Critique the performance issues of cache memory and virtual memory

UNIT - I	NUMBER THEORY and BOOLEAN ALGEBRA	CLASSES: 12

Representation of numbers of different radix, conversion of numbers from one radix to another radix, r-1‘s complement and r‘s complement. 4-bit codes. Basic Theorems and Properties of Boolean algebra, Canonical and Standard Forms, Digital Logic Gates, Universal Logic Gates. K- Map Method.

UNIT - II	COMBINATIONAL and SEQUENTIAL LOGIC CIRCUITS	CLASSES: 14

Design of Half adder, full adder, half subtractor, full subtractor. Decoder, Encoder, Multiplexer, De-multiplexer and comparator. basic flip-flops, truth tables and excitation tables (NAND RS latch, NOR RS latch, RS flip-flop, JK flip-flop, T flip-flop, D flip-flop with preset and clear terminals). Classification of sequential circuits (synchronous and asynchronous);

UNIT - III	DESIGN	CLASSES: 16

Conversion of flip-flops to other flip-flops. Design of Ripple counters, design of synchronous counters, Johnson counter, ring counter, shift register, bi-directional shift register, universal shift register.
Instruction codes, Computer Registers, Computer Instructions and Instruction cycle. Timing and Control Memory-Reference Instructions, Input-Output and interrupt.

UNIT - IV	REGISTER TRANSFER AND MICRO-OPERATIONS:	CLASSES: 16

Central processing unit: Stack organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Complex Instruction Set Computer (CISC) Reduced Instruction Set Computer (RISC),.Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-Operations, Logic Micro-Operations, Shift Micro-Operations, Arithmetic logic shift unit

UNIT - V	MEMORY SYSTEM	CLASSES: 16

INPUT OUTPUT: I/O interface, Programmed IO, Memory Mapped IO, Interrupt Driven IO, DMA.
MULTIPROCESSORS: Characteristics of multiprocessors, Interconnection structures, Inter Processor Arbitration, Inter processor Communication and Synchronization, Cache Coherence

TEXT BOOKS

1. Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rd Edition, Cambridge.
2. Digital Design- Morris Mano, PHI, 3rd Edition.
3. M. Morris Mano (2006), Computer System Architecture, 3rd edition, Pearson/PHI, India.
4. John P. Hayes (1998), Computer Architecture and Organization, 3rd edition, Tata McGrawHill

REFERENCE BOOKS:

1. Introduction to Switching Theory and Logic Design – Fredriac J. Hill, Gerald R. Peterson, 3rd Ed,John Wiley & SonsInc.
2. William Stallings (2010), Computer Organization and Architecture- designing for performance, 8th edition, Prentice Hall, New Jersy.
3. Anrew S. Tanenbaum (2006), Structured Computer Organization, 5th edition, Pearson Education Inc,

OBJECT ORIENTED PROGRAMMING

II B. TECH- I SEMESTER

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
A5IT01	PCC	3	1	-	4	30	70	100

COURSE OBJECTIVES:

1. Understand the basic object oriented programming concepts and apply them in problem solving.
2. Illustrate inheritance and polymorphism concepts for reusing the program.
3. Demonstrate on the exception handling mechanism
4. Demonstrate on the multi-tasking by using multiple threads.
5. Develop data-centric applications using JDBC.
6. Understand the basics of java collection framework.

COURSE OUTCOMES:

1. Use object oriented programming concepts to solve real world problems.
2. Demonstrate the user defined exceptions by exception handling keywords (try, catch, throw, throws and finally).
3. Use multithreading concepts to develop inter process communication.
4. Develop java application to interact with database by using relevant software component (JDBC Driver).
5. Solve real world problems using Collections.

UNIT - I	JAVA BASICS	CLASSES: 15

JAVA BASICS: Review of Object oriented concepts, History of Java, Java buzzwords, JVM architecture, Data types, Variables, Scope and life time of variables, arrays, operators, control statements, type conversion and casting, simple java program, constructors, methods, Static block, Static Data, Static Method String and String Buffer Classes, Using Java API Document

UNIT - II	INHERITANCE , POLYMORPHISM, PACKAGES AND INTERFACES	CLASSES: 15

INHERITANCE AND POLYMORPHISM: Basic concepts, Types of inheritance, Member access rules, Usage of this and Super key word, Method Overloading, Method overriding, Abstract classes, Dynamic method dispatch, Usage of final keyword.

PACKAGES AND INTERFACES: Defining package, Access protection, importing packages, Defining and Implementing interfaces, and Extending interfaces.

UNIT - III	EXCEPTION HANDLING AND FILES	CLASSES: 12

EXCEPTION HANDLING: Exception types, Usage of Try, Catch, Throw, Throws and Finally keywords, Built-in Exceptions, Creating own Exception classes.

I / O STREAMS AND FILES: Concepts of streams, Stream classes- Byte and Character stream, Reading console Input and Writing Console output, File Handling.

UNIT - IV	MULTITHREADING AND JDBC	CLASSES: 12

MULTI THREADING: Concepts of Thread, Thread life cycle, creating threads using Thread class and Runnable interface, Synchronization, Thread priorities, Inter Thread communication.

JDBC-Connecting to Database - JDBC Type 1 to 4 drives, connecting to a database, querying a database and processing the results, updating data with JDBC.

UNIT - V	COLLECTION FRAMEWORK	CLASSES: 10

COLLECTION FRAMEWORK: Introduction to Java Collections, Overview of Java Collection frame work, Generics, Commonly used Collection classes- Array List, Vector, Hash table, Stack, Enumeration,

Iterator, String Tokenizer, Random, Scanner, calender and Properties
TEXT BOOKS:
1. Herbert Schildt and Dale Skrien, "Java Fundamentals – A comprehensive Introduction", McGraw Hill, 1st Edition, 2013. 2. Herbert Schildt, "Java the complete reference", McGraw Hill, Osborne, 7th Edition, 2011. 3. T.Budd, "Understanding Object- Oriented Programming with Java", Pearson Education, Updated Edition (New Java 2 Coverage), 1999.
REFERENCE BOOKS:
1. P.J.Dietel and H.M.Dietel , "Java How to program", Prentice Hall, 6th Edition, 2005. 2. P.Radha Krishna , "Object Oriented programming through Java", CRC Press, 1st Edition, 2007. 3. S.Malhotra and S. Choudhary, "Programming in Java", Oxford University Press, 2nd Edition, 2014.

PYTHON PROGRAMMING

II B. TECH- I SEMESTER

Course Code:	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
A5IT03	PCC	3	1	-	4	30	70	100

COURSE OBJECTIVES:

1. Understand the basics and function of Python Programming Language.
2. Understand the string operation and sequences used in Python Programming Languages.
3. Understand the data structures used in Python Programming Languages.
4. Know the classes and objects in Python Programming Language.
5. Use the reusability concepts in Python Programming Language.

COURSE OUTCOMES:

1. Apply control structures and functions in Program
2. Analyze various String handling functions and data structures
3. Apply the files and object orientation concepts
4. Solve the problems by using Inheritance and polymorphism
5. Illustrate programs on various python libraries such asnumpy, pandas and matplotlib

SYLLABUS

UNIT - I — **CLASSES: 12**

Introduction to Python Programming: Features of Python Language, Data Types, Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Shift Operators, Ternary operator, Membership Operators, Identity Operators, Expressions and order of evaluations. Illustrative examples on all the above operators, Expressions, Control Statements, and Standard I/O Operations: input, print, 'sep','end'.

Functions and Modules:
Declaration and Definition Function Calling, Defining Functions, Recursive Functions, Modules, Packages in Python, Doc Strings, Built-in Functions.

UNIT – II — **CLASSES: 13**

Strings and Regular Expressions:
String Operations, Built-in String Methods and Functions, Comparing Strings, functions in Regular Expression.
Sequence: List, Tuples, Dictionaries.

UNIT - III — **CLASSES: 12**

File Handling: Introduction, File Path, Types of Files, Opening and Closing Files, Reading and Writing Files, File Positions, Renaming and Deleting Files, Directory Methods.

Implementation of classes and objects in Python:

Classes and Objects, Methods and Self Argument, The __init__Method, Class Variables and Object Variables, The __del__Method, Public and Private Data Members, Private Methods,Built-in Functions to Check, Get, Set and Delete Class Attributes, Garbage Collection (Destroying Objects).

UNIT – IV		CLASSES: 11

Implementation of Inheritance in Python:
Inheriting Classes in Python, Types of Inheritance, Composition/Containership, Abstract Classes and Interfaces, Meta class,Implementing Operator Overloading, Overriding Methods

Exception Handling in Python:
Introduction, Exception hierarchy, Handling Exception, Multiple except Blocks and Multiple Exceptions, Finally Block.

UNIT - V		CLASSES: 10

Python NumPy: Features of Numpy, NumPyndarray, Data Types, Functions of NumPy Array, Numpy Array Indexing, Mathematical Functions on Arrays in NumPy.

Python Pandas: Pandas Features, Install Pandas, Dataset in Pandas, Series, DataFrames, Panel, Manipulating the Datasets, Describing a Dataset, group by Function, Filtering, Missing Values in Pandas, Concatenating Data Frames

Matplotlib: Formatting the style of plot, plotting with keyword strings, plotting with categorical variables, controlling line properties.

TEXTBOOKS

1. Core Python Programming, by R.NageswaraRao
2. ReemaThareja, Python Programming using Problem Solving Approach, First Edition,Oxford Higher Eduction.

REFERENCE BOOKS

1. Kenneth A.Lambert, Fundamentals of Python
2. Charles Dierach, Introduction to Computer Science using Python

SUGGESTED LINKS

1. https://www.programiz.com/python-programming
2. https://www.javatpoint.com/python-tutorial
3. https://www.geeksforgeeks.org/python-programming-language/

PYTHON PROGRAMMING LAB

II B. TECH- I SEMESTER

Course Code:	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
A5IT05	PCC	-	-	3	1.5	30	70	100

COURSE OBJECTIVES:

1. Understand the basics and function of Python Programming Language.
2. Understand the string operation and sequences used in Python Programming Language.
3. Know the Data Structures in Python Programming Language.
4. Use the reusability concepts in Python Programming Language.
5. Use Exception Handling mechanism in Python Programming Language.
6. Know the packages in Python Programming Language.

COURSE OUTCOMES:

Student Able to

1. Develop programs on data types, operators and expressions
2. Apply the data structures in real time scenarios
3. Write the programs on strings and functions
4. Implement programs on class and related issues.
5. Use of python exception handling and libraries.

LIST OF EXPERIMENTS

WEEK-1:

- Write a program to perform different Arithmetic Operations on numbers in Python
- Write a Python program which accepts the radius of a circle from the user and compute the area
- Write a Python program to get the Python version you are using.
- Write a Python program that accepts an integer (n) and computes the value of n+nn+nnn.

WEEK-2:

- Write a Python program to convert temperatures to and from Celsius, Fahrenheit. [Formula: c/5 = f-32/9]
- Write a python script to print the current date in the following format “Sun May 29 02:26:23 IST 2017”
- A library charges a fine for every book returned late. For first 6 days the fine is 50 paisa, for 10-15 days fine is one rupee and above 15 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a python program to accept the number of days the member is late to return the book and display the fine or the appropriate message.

WEEK-3:

- Write a python function to find largest of three numbers
- Write a Python function that prints prime numbers in between 50 and 100
- Write a python program to find factorial of a number using Recursion.
- Write a function that receives marks received by a student in 6 subjects and returns the average and percentage of these marks. Call this function from main() and print the result in main

WEEK-4

- Write a program to demonstrate working with tuples and List in python
- Write a program to demonstrate working with dictionaries in python

WEEK-5:

- Write a program to demonstrate working with Strings and string operations

WEEK-6:

- Write a script named hellow.py. This script should prompt the user for the names of two text files. The contents of the first file should be input and written to the second file.
- Write a program that inputs a text file. The program should print all of the unique words in the file in alphabetical order

WEEK-7:

- Write python programs to demonstrate class & object, static and instance method implementation

WEEK -8:

- Write python programs to demonstrate Inheritance and Polymorphism

WEEK-9:

- Write python programs to demonstrate Exception Handling in python

WEEK-10:

- Write python programs todemonstrate Numpy library and supporting functions

WEEK-11:

- Write python programs to demonstrate Pandas libraries' supported structures like series, dataframe and panel

WEEK-12:

- Write a python program to demonstrate matplotlib library and supporting functions

TEXTBOOKS

1. Core Python Programming, by R.NageswaraRao
2. ReemaThareja, Python Programming using Problem Solving Approach, First Edition,Oxford Higher Eduction.

OBJECT ORIENTED PROGRAMMING LAB

II B. TECH- I SEMESTER

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
A5IT02	PCC	-	-	3	1.5	30	70	100

COURSE OBJECTIVES:

1. Practice object-oriented programs and build java applications.
2. Implement java programs for establishinginterfaces.
3. Implement sample programs for developing reusable software components.
4. Create database connectivity in java and implement GUI applications.

COURSE OUTCOMES:

1. Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.
2. Understand the use of different exception handling mechanisms and concept of multithreading for robust and efficient application development.
3. Understand and implement concepts on file streams and operations in java programming for a a given application programs.
4. Develop java application to interact with database by using relevant software component (JDBC Driver).

LIST OF EXPERIMENTS

WEEK - 1 JAVA BASICS

a. Write a java program that prints all real solutions to the quadratic equation $ax^2+bx+c=0$. Read in a, b, c and use the quadratic formula.

b. The Fibonacci sequence is defined by the following rule. The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a java program that uses both recursive and non recursive functions.

WEEK - 2 ARRAYS

a. Write a java program to sort given list of integers in ascending order.

b. Write a java program to multiply two given matrices.

WEEK - 3 STRINGS

Write a java program to check whether a given string is palindrome.

a. Write a java program for sorting a given list of names in ascending order.

WEEK - 4 OVERLOADING & OVERRIDING

Write a java program to implement method overloading and constructors overloading.

a. Write a java program to implement method overriding.

WEEK - 5 INHERITANCE

Write a java program to create an abstract class named Shape that contains two integers and an empty method named print Area (). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method print Area () that prints the area of the given shape.

WEEK - 6 INTERFACES

a. Write a program to create interface A in this interface we have two method meth1 and meth2. Implements this interface in another class named MyClass.

b. Write a program to give example for multiple inheritance in Java.

WEEK - 7	EXCEPTION HANDLING
Write a program that reads two numbers Num1 and Num2. If Num1 and Num2 were not integers, the program would throw a Number Format Exception. If Num2 were zero, the program would throw an Arithmetic Exception Display the exception.	
WEEK - 8	**I/O STREAMS**
a. Write a java program that reads a file name from the user, and then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes. b. Write a java program that displays the number of characters, lines and words in a text file.	
WEEK - 9	**MULTI THREADING**
Write a java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number	
WEEK - 10	**GENERICS**
a. Write a Java program to swap two different types of data using Generics. **b.** Write a Java program to find maximum and minimum of two different types of data using Generics.	
WEEK - 11	**COLLECTIONS**
Create a linked list of elements. a. Delete a given element from the above list. b. Display the contents of the list after deletion	
WEEK - 12	**CONNECTING TO DATABASE**
Write a java program that connects to a database using JDBC and does add, delete, modify and retrieve operations.	

TEXT BOOKS:

1. P. J. Deitel, H. M. Deitel, “Java for Programmers”, Pearson Education, PHI, 4th Edition, 2007.
2. P. Radha Krishna, “Object Oriented Programming through Java”, Universities Press, 2nd Edition, 2007
3. Bruce Eckel, “Thinking in Java”, Pearson Education, 4th Edition, 2006.
4. Sachin Malhotra, Saurabh Chaudhary, “Programming in Java”, Oxford University Press, 5th Edition, 2010.

ENVIRONMENTAL STUDIES

II B. TECH- I SEMESTER

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIE	SEE	Total
A5MC03	MC	2	-	-	-	30	70	100

COURSE OBJECTIVES:

The course should enable the students to:

1. Understanding the importance of ecological balance for sustainable development.
2. Understanding the impacts of developmental activities and mitigation measures.
3. Understanding the environmental policies and regulations
4. Determine the Natural resources on which the structure of development is raised for sustainability of the society through equitable maintenance of natural resources.
5. Illustrate about biodiversity that raises an appreciation and deeper understanding of species, ecosystems and also the interconnectedness of the living world and thereby avoids the mismanagement, misuse and destruction of biodiversity.
6. Summarize a methodology for identification, assessment and quantification of global environmental issues in order to create awareness about the international conventions for mitigating global environmental problems.
7. Sustainable development that aims to meet raising human needs of the present and future generations through preserving the environment.
8. Outline green environmental issue provides an opportunity to overcome the current global environmental issues by implementing modern techniques like CDM, green building, green computing etc.

COURSE OUTCOMES:

On Successful completion of this course, Students will be able to

1. Demonstrate an understanding of the Significance of environmental education.
2. Outline the context of environmentalism.
3. Comprehend the multidisciplinary nature of the course environmental Studies.
4. Illustrate the components of the environment and its interactions.
5. Outline the causes, effects and management options for various environmental problems related to Air, Water and land.

UNIT - I	ECOSYSTEMS	CLASSES: 07

Ecosystems: Definition, Scope and Importance of ecosystem. Classification, structure and function of an ecosystem, Food chains, food web and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Bio magnification, ecosystem value, services and carrying capacity.

UNIT - II	NATURAL RESOURCES & MINERAL RESOURCES	CLASSES: 10

Natural Resources: Classification of Resources: Living and Non-Living resources, water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land resources: Forest resources, Energy resources: growing energy needs, renewable and non-renewable energy sources, use of alternate energy source, case studies.

UNIT - III	BIODIVERSITY AND BIOTIC RESOURCES	CLASSES: 08

Biodiversity and Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.

UNIT - IV	ENVIRONMENTAL POLLUTION AND CONTROL TECHNOLOGIES	CLASSES: 10

Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, Air Pollution: Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. Water pollution: Sources and types of pollution, drinking water quality standards. Soil Pollution: Sources and types, Impacts of modern agriculture,. Noise Pollution: Sources and Health hazards, standards, Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste and its management. Pollution control technologies: Wastewater Treatment methods: Primary, secondary and Tertiary. Overview of air pollution control technologies, Concepts of bioremediation. Global Environmental Problems and Global Efforts: Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS).. International conventions / Protocols: Earth summit, Kyoto protocol and Montréal Protocol.

UNIT - V	ENVIRONMENTAL POLICY, LEGISLATION & EIA	CLASSES: 10

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Towards Sustainable Future: Concept of Sustainable Development, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.

TEXT BOOKS:

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2. Environmental Studies by R. Rajagopalan, Oxford University Press.

REFERENCE BOOKS:

1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHI Learning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.