COURSE OF STUDY AND SCHEME OF EXAMINATION OF B.TECH/B.ARCH/M.TECH/M.C.A.
NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR

Branch- Computer science & Engineering   **Course- B.Tech.(NIT Scheme)**

Semester- III

S.No.	Board of Studies	Sub. Code	Subject Name	Periods/week			Examination Scheme					Total Marks	Credits L+(T+P)/2
				L	T	P	TA	FE	SE	T.C.A	ESE		
1	Mathematics	MA20311(CS)	Computational Mathematics	3	1	-	20	15	15	50	70	120	4
2	Comp. Sc. & Engg.	CS20312(CS)	Digital Logic & Design	3	1	-	20	15	15	50	70	120	4
3	. Comp. Sc. & Engg.	CS20313(CS)	Principles of Management	3	1	-	20	15	15	50	70	120	4
4	Comp. Sc. & Engg.	CS20314(CS)	Problem Solving & Logic Building Using C	3	1	-	20	15	15	50	70	120	4
5	Mathematics	MA20315(CS)	Mathematics III	3	1	-	20	15	15	50	70	120	4
6	Comp. Sc. & Engg.	CS20316(CS)	Computer Fundamentals	4	1	-	20	15	15	50	70	120	5
7	Comp. Sc. & Engg.	CS20321(CS)	Digital Logic & Design(Lab)	-	-	3	30	-	-	30	20	50	2
8	Comp. Sc. & Engg.	CS20322(CS)	Problem Solving & Logic Building Using C(Lab)	-	-	3	30	-	-	30	20	50	2
9	Comp. Sc. & Engg.	CS20323(CS)	Programming Lab	-	-	3	30	-	-	30	20	50	2
10	Humanities	EN20324(CS)	Value Education	-	-	2	25	-	-.	-	0	25	1
11	Comp. Sc. & Engg.	CS20325(CS)	Discipline	-	-	-	25	-	-	-	0	25	1
			Total	19	6	11	260	90	90	440	480	920	33

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SYLLABUS

Name of the Subject	Computational Mathematics	Subject Code	MA20311(CS)
Semester	B.Tech III	Board of Studies	Mathematics
Maximum Marks	70	Minimum Marks	25
Lecture Periods/Week	Tutorial Periods/Week	Practical Periods/Week	Credits
3	1	-	4

UNIT I- ERRORS AND ROOTS OF EQUATIONS
Errors in numerical computation, Error type, analysis and estimation, Error propagation, Roots of algebraic and transcendental equations, Bisection Method, Regula-Falsi Method, Newton-Raphson Method, Secant Method, Birge-Vieta Method, Bairstow's Method.

UNIT II- NUMERICAL SOLUTIONS OF SIMULTANEOUS LINEAR EQUATIONS
Direct Methods - Gauss Elimination, Gauss-Jordan & Crout's Triangularisation Method. Iterative Methods - Jacobi's, Gauss- Siedal & Successive Over Relaxation Method.

UNIT III- INTERPOLATION WITH EQUAL AND UNEQUAL INTERVALS
Finite differences, Newton's Forward & Backward Difference Formulae, Central Difference Formula, Stirling's Formula, Bessel's Formula, Lagrange's Formula and Newton's Divided Difference Formula.

UNIT IV- NUMERICAL DIFFERENTIATION AND INTEGRATION
Derivatives using Forward, Backward and Central Difference Formulae .Newton-Cote's Quadrature Formula,Trapezoidal rule, Simpson's rules, Weddle's rule.

UNIT V- NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS
Picard's Method, Taylor's Series Method, Euler's Method, Euler's Modified Method, Runge - Kutta fourth order Methods, Predictor-corrector Methods- Milne's Method, Adams-Bash forth Method.

TEXT BOOKS:
1. Numerical Methods in Engineering and Science by Dr. B.S. Grewal, Khanna Publishers.
2. Numerical Methods for Scientific and Engineering Computation by M .K. Jain, S. R. K. Iyengar & R. K. Jain, Wiley Eastern Limited

REFERENCE BOOKS:
1. Numerical Methods for Scientists and Engineers by K. Shankar Rao, Prentice Hall of India.
2. Numerical Methods with C++ Programming, by Somasundaram & Chandrasekaran, Prentice Hall of India.
3. Numerical Methods, by S. S. Shastry, Prentice Hall Inc. India 1998.

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SYLLABUS

Name of the Subject	Digital Logic & Design	Subject Code	CS20312(CS)
Semester	B.Tech III	Board of Studies	Comp.Sc.& Engg.
Maximum Marks	70	Minimum Marks	25
Lecture Periods/Week	Tutorial Periods/Week	Practical Periods/Week	Credits
3	1	-	4

UNIT-I Overview of Boolean Algebra AND Logic Gates :
Number Systems and Codes, Binary Arithmetic, Boolean Algebra, Minimisation of Switching Function , Demorgan's Theorem, Karnaugh's Map Method (limited up to 4-variables), Quine McCluskey's Method , Cases with Don't care conditions and multiple output switching functions.

UNIT-II Combinational Circuits :
NAND / NOR gates , Realization of switching functions , Half/full adders, Half / full subtractors , Series and parallel additions ,BCD adders ,Look ahead carry generators ,Decoders and encoders ,BCD to 7 segment decoders, Multiplexers and Demultiplexers, Parity bit generator and detector Error detection.

UNIT-III Sequential Circuits :
Introduction to registers and Counters **:** Flip-Flops and their conversion, Excitation Tables, Synchronous and Asynchronous counters and Designing of sequential circuits: code converter and counters. Mode-k anddivide by KCounters, Counter Applications.

UNIT-IV Logic Families:
RTL, DTL, all types of TTL circuits, ECL, Circuit, Operation & Features of I2 L and PMOS, NMOS and CMOS logicetc.

UNIT-V Memories and Converters :
Introduction to various semiconductor memories and designing of ROM and PLA , Introduction to analog to digital and digital to analog converters and their types (R-2R ladder network and successive approximation converters)

Name of Text Books
1. W H Gothman , " Digital Electronics" PHI
2. R. P. Jain : "Modern Digital electronics", TMH

Name of Reference Books :
1. R J Tocci, " Digital System principles and Applications"
2. Millman Taub , " Pulse , Digital and Switching Waveforms " TMH
3. M.M. Mano : "Digital logic and computer design", PHI.
4. Floyd : "Digital fundamentals", UBS.
5. B. Somanathan Nair, "Digital eletronics & Logic Design", Prentice-Hall of India

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Name of the Subject	Principles of Management	Subject Code	CS20313(CS)
Semester	B.Tech III	Board of Studies	Comp.Sc.& Engg.
Maximum Marks	70	Minimum Marks	25
Lecture Periods/Week	Tutorial Periods/Week	Practical Periods/Week	Credits
3	1	-	4

Unit-I Introduction
Definition of Management, Nature and Basic Concepts of Management, Management and Administration, Functions of Manager & Information age; Science, theory and practice of Management. Managerial objectives and Role, Evolution of management Thoughts, Business Environment, Social attitudes beliefs and Values, Social Responsibilities of Business.

Unit-II Functions of Management
Planning, Nature and importance, Steps in Planning; Organizing and process of organizing; Staffing, Systems approach to staffing; Directing; Controlling and process of controlling, Decision Making.

Unit-III Motivation
Meaning, need for motivation, Theories of Motivation. Leadership – Meaning and styles, group and team working, HRM.

Unit –IV Functional Areas
Marketing - Market and Marketing environment, Consumer / buyer behavior, marketing mix, Advertisement and sales Promotion.
Financial Management – Introduction to Book keeping and financial statements, Break Even analysis.

Unit-V Emerging Trends in Management
Production and Productivity, Production Planning and Control, TQM, Globalization and WTO, Business process reengineering, IT in Management, Outsourcing.

Text Books:-
1. Govindrajan M, & Natrajan, S, Principles of Management, Prentice Hall of India, N. Delhi,2005.
2. Luthans Fred Organizational Behavior, TMH, New Delhi

Reference Books:-
1. Koontz and O'Donnell, Principles of Management and administration, Prentice Hall of India (PHI)
2. Peter F Drucker, The Practice of Management, Allied Publicatons.
3. Robbins, S. P. 3rd edition, Fundamental of Management, PHI, N. Delhi,2005
4. Chandan J. S, Management Concepts and Strategies, Vikas Publication, N. Delhi,2006
5. S.N. Maheshwari, An Introduction to accountancy Vikas Publication, N Delhi.

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SYLLABUS

Name of the Subject	Problem Solving and Logic Building using C	Subject Code	CS20314(CS)
Semester	B.Tech III	Board of Studies	Comp.Sc.& Engg.
Maximum Marks	70	Minimum Marks	25
Lecture Periods/Week	Tutorial Periods/Week	Practical Periods/Week	Credits
3	1	-	4

Unit-I Elements of C Language
Origin of C, Features & Characteristic of C, C Compiler, Character Set, Keywords, Identifiers, Constants, Variables, Input/ Output Statements, Basic Data Types, Operators and Expressions, Tools for Problem Solving: Problem Analysis, Flowchart, and Algorithm Development. Top-Down Program Design, Structured Design Approach, Basic structure of C programs, A simple C Program.

Unit-II Control Flow Construction
Decision making and branching: Simple if statement, if else statement, Nesting of if... else statement, else.. if Ladder, switch statement, ?: operator, goto statement. Decision making and looping: while statement, do...While statement, for statement, jumps in loops, break and continue statement.

Unit-III Defining and Manipulating Arrays
One- Dimensional Arrays: Declaration of Arrays, Initialization of Arrays, Reading and Writing of integer, real and character arrays, Sorting and Searching in Arrays, Multi-Dimensional Arrays, Handling of Character Strings.

Unit-IV User Defined Functions
Syntax of Function, Calling functions, Actual & Formal Arguments, Categories of Functions, Function Proto type, Scope Rules: Local & Global variables, Recursion, Recursion vs. iteration, Passing Arguments: call by values & call by reference, Passing array to function.
Structures: Declaration and initialization of structures, Array of structures, Array within structure, structure within structure, Structures and functions, Introduction to unions.

Unit-V Pointer Data type and its Application
Pointer Operator, Pointer Expression, Initializating pointers, Pointer Arithmetic, Pointer and Function Arguments, Pointer to function, Pointer and Arrays, Pointers and String, Arrays of Pointers, Pointers to Pointers. Files in C: Defining and opening a file, closing a file, input/ Output operations on files, error handling during I/O operations, random access to files.

Name of Text Books:
1. Programming in C by Byron Gottfrid.(Schoum's series outline TMH)
2. Programming in C By E. Balagurusamy (TMH)

Name of Reference Books:
1. The C programming Language by Dennis M Ritchie and Kernighan (PHI)
2. Let us C by Yashwant Kanetkar (BPB Publication)
3. C for all by S. Thamarai Selvin & R. Murugesan (Anuradha Agencies)
4. Programming in C by Ghosh (PHI)
5. Computer Programming in C by V. Rajaraman (PHI)

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Name of the Subject	Mathematics-III	Subject Code	MA20315(CS)
Semester	B.Tech III	Board of Studies	Mathematics
Maximum Marks	70	Minimum Marks	25
Lecture Periods/Week	Tutorial Periods/Week	Practical Periods/Week	Credits
3	1	-	4

UNIT - I FOURIER SERIES AND FOURIER TRANSFORM
Expansion of function as Fourier series, Change of interval, Even and odd functions, Half-range Fourier series, Practical harmonic analysis, Fourier Sine and Cosine transforms, Properties of Fourier transform, Inverse Fourier transform, Fourier transform of derivatives.

UNIT – II LAPLACE TRANSFORM
Laplace transform of elementary functions, Properties of Laplace transform, Laplace transform of derivatives and integrals, multiplication by tn and division by t, Laplace transform of periodic functions. Inverse Laplace transform, Convolution theorem, Laplace transform of unit step function and Dirac delta function, Application of Laplace transform to solutions of ordinary differential equations.

UNIT - III THEORY OF COMPLEX VARIABLES
Limit, Derivative and Analytic functions; Cauchy-Riemann equations and its applications to flow problems; Complex Integration: Line and Contour integral, Cauchy integral theorem and Integral formula; Taylor series, Laurent series; singularities; Poles and their orders and residues; Evaluation of real definite integrals.

UNIT - IV PARTIAL DIFFERENTIAL EQUATION
Formation of partial differential equations, Lagrange's solution of first order linear partial differential equation, Homogeneous and Non-homogeneous linear partial differential: Non-linear partial differential of first order, Charpit's method and Jacobi's method, Solution of partial differential equations by the method of separation of variables.

UNIT - V PROBABILITY AND SAMPLING DISTRIBUTIONS
Discrete and continuous probability distributions, Chebyshev's theorem, Binomial distribution, Poisson distribution, Normal distribution, Gamma distribution and Exponential distribution, Relation between exponential, Gamma and Poisson distribution, Sampling distribution, Sampling distribution of mean, variances, differences and sums.

TEXT BOOKS: -
1. Higher Engg. Mathematics by Dr. B.S. Grewal– Khanna Publishers.
2. Advanced Engg. Mathematics by Erwin Kreyszig – John Wiley & Sons.
3. Higher Engg. Mathematics by B.V.Ramana – Tata McGraw-Hill Publishing.
4. Elements of partial differential equations by I.N.Sneddan – McGraw-Hill International Editions.

REFERENCE BOOKS: -
1. Advanced Engg.Mathematics by R.K. Jain and S.R.K. Iyengar – Narosa Publishing House.
2. Applied Mathematics by P.N.Wartikar & J.N. Wartikar. Vol- II– Pune Vidyarthi Griha Prakashan, Pune.
3. Applied Mathematics for Engineers & Physicists by Louis A. Pipes- TMH.

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Name of the Subject	Computer Fundamental	Subject Code	CS20316(CS)
Semester	B.Tech III	Board of Studies	Comp.Sc. & Engg.
Maximum Marks	70	Minimum Marks	25
Lecture Periods/Week	Tutorial Periods/Week	Practical Periods/Week	Credits
3	1	-	4

UNIT-I FUNDAMENTALS OF COMPUTERS AND OPERATING SYSTEMS

Evolution of Computers - Organization of Modern Digital Basic structure of Computer Hardware-Von-Neumann Architecture-Functional units –Instruction format Typical Architectures, Computers-Operating system and functions, Classification of Operating systems- Batch, Interactive, Time sharing, Real Time System, Multiprocessor Systems, Multiuser Systems.

UNIT-II INTRODUCTION TO DATA STRUCTURES AND ALGORITHM ANALYSIS

What is Data Structure Introduction: Basic Terminology, Elementary Data Organization,– Introduction to Algorithm – Introduction: Algorithms, Analysis of Algorithms, Design of Algorithms, Complexity of Algorithms, Asymptotic Notations, Growth of function

UNIT-III INTRODUCTION TO SOFTWARE ENGINEERING

Introduction to Software Engineering, Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Software Quality Attributes. Software Development Life Cycle (SDLC) Models: Water Fall Model

UNIT-IV INTRODUCTION TO DBMS

Database Management Systems-An overview of database management system, database system Vs file system, Database system concept and architecture, data model schema and instances, data independence and database language and interfaces, data definitions language, DML, Overall Database Structure.

UNIT-V INTRODUCTION TO COMPUTATION AND COMPILERS

Introduction to Theory of formal languages , Automata and Computability Compilers and Translators, Various Phases of Compiler, Pass Structure of Compiler Lexical Analysis: The Syntactic Specification of Programming Languages Intermediate Code Generation Code Optimization, Bootstrapping

Text Books:

1 Computer Systems Architecture - M. Morris Mano, Prentice-Hall of India
2 Introduction to Algorithms (Second Edition); Cormen, Lelserson, Rivert; PHI.
3 Data Structure by Seymour Lipschutz & G. a. Vijayalaksmi Pai (Schaum's outlines)
4 Fundamentals of Computer, V. Rajaraman, Prentice-Hall of India
5 Database system concept, Korth & Sudarshan, MH.
6 Silberschatz, Galvin and Gagne, "Operating Systems Concepts", Wiley
7. Aho, Sethi & Ullman, "Compilers: Principles, Techniques and Tools", Pearson Education
8.Martin J. C., "Introduction to Languages and Theory of Computations", TMH
9. Hopcroft, Ullman, "Introduction to Automata Theory, Languages and Computation", Pearson Education

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Name of the Subject	Digital Logic & Design (Lab)	Subject Code	CS20321(CS)
Semester	B.Tech III	Board of Studies	Comp.Sc. & Engg.
Maximum Marks	30(TA) 20(ESE)	Minimum Marks	18(TA) 10(ESE)
Lecture Periods/Week	Tutorial Periods/Week	Practical Periods/Week	Credits
-	-	3	2

Experiments to be Performed (minimum 10 experiments)
1) To study the characteristics and operations of TTL Inverters, OR, AND, NOR and NAND gate using ICs.
2) To study NAND and NOR gates as a universal logic.
3) To study and prove Demorgan's Theorem .
4) To design Half and Full adder circuits using logic gates.
5) To design Half and full subtractor circuits using logic gates.
6) To study the binary parallel adder.
7) To design 4 bit magnitude comparator circuits.
8) To study the 7 segment decoder .
9) To design 4:16 decoder using two 3:8 decoder and four 2:4 decoder
10) To design 16: 1 Multiplexer using 4:1 Multiplexer.
11) To study various types of flip flops using logic gates and ICs.
12) To design Mode-N and divide by K counter.
13) To construct a 4 bit binary to gray converter and vice versa using IC 7486 .
14) To study Up-Down counter .
15) To study programmable shift registers.

List of Equipments /Machine Required:
1) Logic gate trainer
2) Digital ICs Trainer
3) Various ICs 7400,7402,7404,7408,7432,7486,74138,74151,74155 etc.

Recommended Books:
1) M.M. Mano : "Digital logic and computer design", PHI.
2) Floyd : "Digital fundamentals",UBS.

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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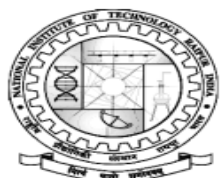| Name of the Subject	Problem Solving & Logic Building Using C(Lab)	Subject Code	CS20322(CS)
Semester	B.Tech III	Board of Studies	Comp.Sc. & Engg.
Maximum Marks	30(TA) 20(ESE)	Minimum Marks	18(TA) 10(ESE)
Lecture Periods/Week	Tutorial Periods/Week	Practical Periods/Week	Credits
-	-	3	2

1. Write a program to take the radius of a sphere as input and print the volume and surface and surface area of that sphere.
2. Write a program to take a 5-digit number as input and calculate the sum of its digits.
3. Write a program to take three sides of a triangle as input and verify whether the triangle is an isosceles, scalene or an equilateral triangle.
4. Write a program that will take 3 positive integers as input and verify whether or not they form a Pythagorean triplet or not.
5. Write a program to print all the Prime numbers between a given range.
6. Write a program to define a function that will take an integer as argument and return the sum of digits of that integer
7. Write a program to define a macro that can calculate the greater of two of its arguments. Use this macro to calculate the greatest of 4 integers.
8. Write a program to define a recursive function that will print the reverse of its integer argument.
9. Write a program to print the sum of first N even numbers using recursive function.
10. Write a program to sort an array using Bubble sort technique.
11. Write a program that will take the elements of two integer arrays of 5 element each, and insert the common elements of both the array into a third array (Set intersection)
12. Write a program to take 5 names as input and print the longest name.
13. Write a program to define a structure Student that will contain the roll number, name and total marks of a student. The program will ask the user to input the details of 5 students and print the details of all the students whose total marks is greater than a given value.
14. Write a program to define a union Contact that will contain the members Mobile no and E-mail id. Now define a structure Employee that will contain name, roll number, mode of contact (mob/e-mail) and a variable of type Contact as members. The program will ask the user to give the details of two Employees including mode of contact and the contact num/ E-mail. Print the details of both the Employees.
15. Write a program that will ask the user to input a file name and copy the contents of that file into another file.
16. Write a program that will take any number of integers from the command line as argument and print the sum of all those integers.
17. Write a program to process sequential file for payroll data.
18. Write a program to process random file of library data.

List of Equipments/Machine Required:
PCs, C-Compiler
Recommended Books:
 Programming in ANSI C – E. Balaguruswamy Tata Mc-Gcraw Hill

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Name of the Subject	Programming Lab	Subject Code	CS20323(CS)
Semester	B.Tech III	Board of Studies	Comp.Sc. & Engg.
Maximum Marks	30(TA)　　20(ESE)	Minimum Marks	18(TA)　　10(ESE)
Lecture Periods/Week	Tutorial Periods/Week	Practical Periods/Week	Credits
-	-	3	2

1. Visual Basic- an Integrated Development Environment (IDE): An introduction, Explain New project window, Property window, Project Explorer window, Watch window, etc. Design and identity card containing information regarding students such a s Name, Roll No., Address, Class studying, Date of Birth, Blood Group, Phone No., etc. Add a Exit Button.
2. Develop an application to calculate Interest. It should accept rate of interest, period for calculation of interest (years), amount on which interest is to be calculated (Rs.). After clicking Compute
    Investment amount (Principal + Interest) should be displayed in separate text box.. Add Exit button, Proper text box controls and labels to be used. Provide 2 options- Simple, Compound interest Provide Picture and Radio Button control.
3. Design a Simple Calculator to implement addition, subtraction, multiplication, division, remainder operations of two digits(include validation of input & proper message).
4. Create a form using check box & option box to give effect for fonts such as bold, italic, underline, strike through respectively for the text entered in the Rich Text Box (add status bar control).
5. Create a form to access drive list, directory list, and files within a directory of the computer you are using (use Tree structure, menus & toolbars).
6. Design a form for demonstration of print method (Error code, Error message display). Use print control box. Log the status of each message in a log file.
7. Demonstrate use of Date Environment, add tables and queries, place fields on form, report etc.
8. Generate single table report & two table grouped report outputs.
9. Design a program to display regional languages of different states in India. Take many names of status of India in one list box control and other text box control should display their languages e. g. Maharashtra Marathi etc.
10. CASE STUDY (Design and develop one of the following three case studies):
1. Create a Scientific Calculator (add minimum 15 functions).
2. Develop a program for Online Examination system, which includes database and record keeping facility.
3. Develop a program for Payroll System, which can handle database as well as can print the pay slips of employees. In this system provide a Login Window, which will accept the User Name and Password. After verifying the user information, the user should get the access to Payroll System.
11. Create a Simple Notepad application, which contains Menus, Rich Text Box, Common Dialog box, Formatted text, using Toolbar, and Replace text, Windows (Tile / Cascade), Status bar and scroll bar.
12. Modify the practical No. 7 to add following buttons: FIND, ADD, DELETE, UPDATE, and CANCEL. Give proper code to perform the activity described by the buttons.
13. Display the Table Data using ADODC. Add Find, Delete, Update, Cancel Buttons on the form.
14. Display the data from two different tables having common keys using Visual data manager. Use Flex Gride control to display data.
15. Use Active –X control in the form which is created in previous practical.

List of Equipments / Machine Required:
1. P-3 or above Computer System. **2**. Microsoft Visual Studies 6.0 **3.** MSDN Library
4. Database (Oracle / MS Access)
Recommended Books
1.　Black Book (VB) **2.** Complete Reference (VB)

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<u>SYLLABUS</u>

Name of the Subject	Value Education	Subject Code	EN20324(CS)
Semester	B.Tech III	Board of Studies	Humanities
Maximum Marks	25	Minimum Marks	15
Lecture Periods/Week	Tutorial Periods/Week	Practical Periods/Week	Credits
-	-	2	1

UNIT − I STUDY OF BASIC HUMAN OBJECTIVES :

Everlasting solution (समाधान), prosperity (समृद्धि), trust in self and others (अभय), and coexistence (सहअस्तित्व) for balance in nature. Need and importance of aforesaid basic human objectives and how to achieve these.

UNIT-II CONCEPT AND UNDERSTANDING OF HUMAN HAPPINESS

Meaning and concept of "happiness", incessant happiness, its relationship with gurantee of
physical needs, comforts, physical and sensory pleasures with its transient nature, misery; The only method to minimize incessant happiness : gaining right understanding about oneself, one'sbody, one's relationship with other human beings, Nature and total existence.

UNIT-III PROPER UNDERSTANDING

About the order in Nature (व्यवस्था) and co-existence (सहअस्तित्व) at various levels, such as,I and my body, family, society, Nature and existence.
. UNDERSTANDING THE SELF: Understanding human reality – I and my body, present
understanding of the self, physical needs, relation with others and with Nature, gaining proper understanding of the self, discrimination between 'I' and my 'body', characteristics and the needs of 'I', of my 'body' and 'body' & 'I'.

UNIT-IV SYNERGATIC ORDER (व्यवस्था) and COEXISTENCE (सहअस्तित्व) among HUMANS, IN NATURE & IN EXISTENCE :

- Conceptual understanding of natural relations and consequent values, of family and relationthere in, of society and role of engineers therein,overall excellence' : concept, its universal parameters and total human behaviour
- Inanimate (जड़) and consciousness (चैतन्य) aspects of Nature, Four distinct synergeticorders in Nature - Padaarth Awastha (पदार्थ अवस्था), Pran Awastha (प्राण अवस्था), JivAwastha (जीव अवस्था), and Gyan Awastha (ज्ञान अवस्था), complementary
supplementary evolutionary connection amongst above orders, identifying and implementing"Appropriate Technology".- Synergetic order among interacting entities of Nature operating in all pervading changelessShunya or Satta, Indivisible interconnectedness of Satta and Prakriti and its implications.

UNIT − V IMPLICATIONS OF PROPER UNDERSTANDING

- Awakening (जागृति), the common goal of all human beings,- promotion and perseverance of synergetic order and co-existence at all levels leading to incessant happiness.- Natural manifestation of universal human values and thereby incessant happiness
- Undivided Society (अविभाज्य समाज) and Universal Organised System (सार्वभौम व्यवस्था)
- Transition from synergetic disorder (अव्यवस्था) to synergetic order (व्यवस्था)
- Evaluation of Understanding, work and behaviour.

REFERENCES
1. Jeevan Vidya Camp (शिविर) notes
2. An Introduction to Jeevan Vidya by Shri A. Nagaraj