VISHNU INSTITUTE OF TECHNOLOGY:: BHIMAVARAM
(Autonomous)

Approved by AICTE, Accredited by NAAC-A^{++}, NBA& Affiliated to JNTUK, Kakinada

Department of Basic Science

(R-20 Regulations)

Syllabus: I B.Tech-II Semester

(Common to all Branches except CS&BS)

Course Title: Mathematics-II (Vector Calculus& Transform Calculus)

L	T	P	C
3	0	0	3

Course Objectives:

1. find the vector differentiation and Integration
2. apply the techniques of Laplace transforms in engineering studies
3. learn the Fourier series of periodic functions and expand a function in sine and cosine series
4. solve problems related to engineering applications using integral transform techniques
5. evaluate the problems to engineering applications using Z- transform techniques

UNIT-I: Vector Differentiation

Vector Differentiation - Scalar and Vector Fields, Level surfaces, Directional Derivative, Gradient of a Scalar Field, Divergence, Curl of a vector field and applications, Vector Identities

UNIT-II: Vector Integration

Vector Integration - Line integral, work done, areas, Surface integrals.

Vector integral theorems - Green's theorem, Stokes theorem and Gauss Divergence theorem (All theorems without proof) and applications areas,surface areas and volumes.

UNIT-III: Laplace Transforms

Laplace transform-Definition-conditions for existence– Linear Property -Shifting Theorems, Laplace transforms of Standard Functions-Transforms of derivatives and integrals–Unit step function–Dirac delta function.

Inverse Laplace transforms by Partial fractions–Convolution theorem (without proof) – inverse by convolution,Solving ordinary differential equations with constant coefficients.

UNIT - IV: Fourier Series

Introduction, Periodic function, Dirichlet's conditions, Fourier series of periodic function, Fourier series at the point of discontinuity, Fourier series of even and odd functions, Half-range Fourier Sine and Cosine series.Fourier series in an arbitrary interval.

UNIT- V: Fourier Transforms and Z-Transforms

Fourier integral theorem (only statement) – sine and cosine integrals, Fourier transforms – sine and cosine transforms –Inverse Formulae-Properties- Finite Fourier Transforms.

Z-transform – properties – Damping rule – Shifting rule – Initial and final value theorems – Inverse Z – transform - Convolution theorem – solving difference equations by using Z-transforms.

Text Books:

1. B. S. Grewal, Higher Engineering Mathematics, 42nd Ed., Khanna Publishers, New Delhi, 2012
2. Erwin.Kreyszig,Advanced Engineering Mathematics,9th Ed., Wiley, 2012

References:

1. T.K.V.Iyengar, B. Krishna Ghandhi, S. Ranganathan and M.V.S.S.N.Prasad, Engineering Mathematics, Volume-I, 12th Ed., S. Chand Publishers, 2014
2. B. V. Ramana, Engineering Mathematics, 4th Ed., Tata McGraw Hill, New Delhi, 2009
3. D. S. Chandrashekharaiah, Engineering Mathematics, Volume 1, Prism Publishers, 2010
4. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, reprint, 2008

Course Outcomes:

After completing this course, the students will be able to

1. understand gradient, divergence, curl and their physical significance
2. compute line, surface and volume integrals and evaluate the work done, flux, potential functions
3. makeuse of Laplace transforms in solving the differential equations with the initial and boundary conditions.
4. compute Fourier series of periodic functions
5. solve problems related to engineering applications using transform techniques

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Department of Basic Science

Syllabus: I B. Tech-I/II Semester

(R-20 Regulations)

(Common to all circuital branches like ECE, EEE, CSE, IT, AI&DS and AI&ML etc.)

Course Title: Applied Physics

L	T	P	C
3	0	0	3

Course Objectives:

- To identify the importance of the optical phenomenon i.e. interference, diffraction and polarization related to its Engineering applications
- To Understand the mechanism of emission of light, utilization of lasers as coherent light sources for low and high energy applications. Study of propagation of light through optical fibers and their implications in optical communications
- To explain the significant concepts of dielectric and magnetic materials that leads to potential applications in the emerging micro devices.
- Enlightenment of the concepts of Quantum Mechanics and to provide fundamentals of deBroglie matter waves, quantum mechanical wave equation and its application and to know the importance of free electron theory for metals.
- Enlightenment of the importance of band theory for crystalline solids and metals. To understand the physics of Semiconductors and their working mechanism.

UNIT –I: Wave Optics

Interference:

Introduction - Principle of Superposition-Coherence-Conditions for Sustained Interference -Interference in thin films (reflected Geometry)-Newton's Rings-Determination of Wavelength and Refractive Index-Applications of Interference.

Diffraction:

Introduction- Fresnel and Fraunhofer diffraction-Fraunhofer Diffraction due to Single slit, Double slit –N – slits (Qualitative)-Diffraction Grating -Determination of Wavelength-Applications of Diffraction.

Polarization:

Introduction- types of polarized light, Polarization by reflection, refraction and double refraction- Nicol's prism-Half wave and Quarter wave plates

UNIT- II: Lasers and Fiber Optics

Lasers:

Introduction-Characteristics of Laser–Spontaneous and Stimulated emissions of radiation-Einstein's coefficients & Relation between them and their significance – population inversion - Ruby laser – Helium Neon laser –Semiconductor diode laser(Qualitative)- Applications of Lasers.

Fiber Optics:

Introduction to Optical Fibers-Total Internal Reflection- Construction of optical fibers -Acceptance angle-Numerical Aperture-Classification of fibers based on Refractive index profile, modes -Block Diagram of Fiber optic Communication- Applications of optical fibers.

UNIT –III: Magnetic Materials & Dielectric Properties

Magnetic Materials:

Introduction -Magnetic dipole moment-Magnetization-Magnetic susceptibility and permeability- Origin of permanent magnetic moment -Classification of Magnetic materials-Weiss theory of ferromagnetism (qualitative)-Hysteresis-soft and hard magnetic materials-Magnetic device applications.

Dielectrics :

Introduction to Dielectrics - Electric polarization - Dielectric polarizability, Susceptibility and Dielectric constant- Types of polarizations - Electronic and Ionic polarizations with mathematical derivations – Orientational polarization (Qualitative)–Internal field in solids -Claussius -Mosotti equation.

UNIT – IV: Quantum Mechanics and Free Electron Theory of Metals

Quantum Mechanics:

Introduction- Dual nature of matter-Matter waves, de-Broglie wavelength, Properties of wave function- time independent and time dependent Schrödinger's wave equation-Particle in a one dimensional infinite potential well.

Free Electron Theory of Meals:

Classical free electron theory (Qualitative with discussion of merits and demerits)-Quantum free electron theory-Equation for electrical conductivity based on quantum free electron theory-Fermi-Dirac Distribution-density of states (3D) - Fermi Energy.

UNIT –V: Band Theory of Solids and Semiconductors

Band Theory of Solids:

Bloch Theorem - Kronig-Penny Model (Qualitative)-E vs K and v vs K diagram- Origin of energy bands - Classification of solids based on energy bands – Effective Mass of an Electron-Concept of a Hole

Semiconductors:

Introduction– Intrinsic semiconductors - density of charge carriers-Fermi level – extrinsic semiconductors - P-type & N-type - Density of charge carriers - Dependence of Fermi energy on carrier concentration and temperature - Drift and Diffusion currents – Einstein's equation - Hall effect- Hall coefficient - Applications of Hall effect.

Text Books:

1.M.N. Avadhanulu, P.G.Kshirsagar "A Text book of Engineering Physics"-S.Chand Publications,2017
2. H.K.Malik & A.K.Singh "Engineering Physics",- McGraw Hill Publishing Company Ltd, 2018
3. P.K. Palanisamy, Applied Physics, SciTech Publications.

References:

1. Gerd Keiser "Optical Fiber Communications"- 4/e, Tata Mc GrawHill.
2. Charles Kittel "Introduction to Solid State Physics",Wiley Publications.
3. S.M.Sze "Semiconductor devices-Physics and Technology"-Wiley.
4. Halliday, Resnick and Walker, "Fundamentals of Physics", John WileySons.
5. M.R. Srinivasan, Engineering Physics, NewAge International Publishers.
6. Ajoy Ghatak "Optics" Tata Mc GrawHill.

Course Outcomes:

Upon the completion of the course the students will be able to:

CO1: Explain the need of coherent sources and the conditions for sustained interference. Identify the applications of interference in engineering. Analyze the differences between interference and diffraction with applications. Illustrate the concept of polarization of light and its applications.

CO2 Explain various types of emission of radiation. Identify the role of laser in engineering applications. Describe the construction and working principles of various types of lasers. Explain the working principle of optical fibers. Classify optical fibers based on refractive index profile and mode of propagation. Identify the applications of optical.

CO3: Explain the concept of dielectric constant and polarization in dielectric materials. Summarize various types of polarization of dielectrics. Classify the magnetic materials based on susceptibility and their temperature dependence. Explain the applications of dielectric and magnetic materials. Apply the concept of magnetism to magnetic devices.

CO4: Describe the dual nature of matter. Explain the significance of wave function. Identify the role of Schrodinger's time independent wave equation in studying particle in one-dimensional infinite potential well. Identify the role of classical free electron theory in the study of electrical conductivity.

CO5**:** Explain the concept of quantum free electron theory in the study of electrical conductivity. Classify the energy bands of solids. Outline the properties of charge carriers in semiconductors. Identify the type of semiconductor using Hall effect. Identify applications of semiconductors in electronic devices.

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Year/Semester	I B. Tech/II Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	**Digital Logic Design**				
Branch	CSE,IT, AI&DS				

Course Objectives:

- To study the basic philosophy underlying the various number systems, negative number
- representation, binary arithmetic, theory of Boolean algebra and map method for

  Minimization of switching functions.

- To introduce the basic tools for design of combinational and sequential digital logic.
- To learn simple digital circuits in preparation for computer engineering.

UNIT- I: Digital Systems and Binary Numbers: Digital Systems, Binary Numbers, Octal and Hexadecimal Numbers, Complements of Numbers, Signed Binary Numbers, Arithmetic addition and subtraction,4-bit codes: BCD, EXCESS-3, 9's complement.

UNIT -II: Concept of Boolean algebra: Basic Theorems and Properties of Boolean algebra, Boolean Functions, Canonical and Standard Forms, Minterms and Maxterms.

UNIT- III: Gate level Minimization: Map Method, Two-Variable K-Map, Three-Variable K-Map, Four Variable K-Maps. Products of Sum Simplification, Sum of Products Simplification, Don't – Care Conditions, NAND and NOR Implementation, Exclusive-OR Function

UNIT- IV: Combinational Logic: Introduction, Analysis Procedure, Design Procedure, Binary Adder–Subtractor, Decimal Adder, Binary Multiplier, Decoders, Encoders, And Multiplexers.

UNIT- V: Synchronous Sequential Logic: Introduction to Sequential Circuits, Storage Elements: Latches, Flip-Flops: RS,JK, T and D Flip-Flops, Truth and Excitation Tables, Conversion of Flip-Flops. Registers and Counters: Basics of Registers and Counters

Course outcomes:

A student who successfully fulfils the course requirements will have demonstrated:

- An ability to define different number systems, binary addition and subtraction, 2's Complement representation and operations with this representation.
- An ability to understand the different switching algebra theorems and apply them for Logic functions.
- An ability to define the Karnaugh map for a few variables and perform an algorithmicreduction of logic functions.
- Students will be able to design various logic gates starting from simple ordinary gates tocomplex programmable logic devices.
- Students will be able to design various sequential circuits starting from flip-flop to Registers and counters.

Text Books:

1) Digital Design, 5/e, M.Morris Mano, Michael D Ciletti, PEA.

2) Fundamentals of Logic Design, 5/e, Roth, Cengage.

Reference Books:

1) Digital Logic and Computer Design, M.Morris Mano, PEA.

2) Digital Logic Design, Leach, Malvino, Saha, TMH.

3) Modern Digital Electronics, R.P. Jain, TMH.

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Year/Semester	I B. Tech/II Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	Programming for Problem Solving				
Branch	CSE,IT, AI&DS,EEE				

Course Objectives:

- Formulating algorithmic solutions to problems and implementing algorithms in C.
- Understanding branching, iteration and data representation using arrays.
- Modular programming and recursive solution formulation.
- Understanding arrays, pointers and dynamic memory allocation.
- Understanding Strings and Structures

UNIT-I:

Introduction to C Programming- Identifiers, The main () Function, The printf () Function **Programming Style** - Indentation, Comments, Data Types**,** Arithmetic Operations, Expression Types, Variables and Declarations, Negation, Operator Precedence and Associativity, Declaration Statements, Initialization.

Assignment - Implicit Type Conversions, Explicit Type Conversions (Casts), Assignment Variations, Mathematical Library Functions, Interactive Input, Formatted Output, Format Modifiers.

UNIT-II:

Control Flow-Relational Expressions - Logical Operators:

Selection: if-else Statement, nested if, examples, Multi-way selection: switch, else-if, examples.

Repetition: Basic Loop Structures, Pretest and Posttest Loops, Counter-Controlled and Condition-Controlled Loops, The while Statement, The for Statement, Nested Loops, The do-while Statement.

UNIT-III:

Arrays & Pointers:

Arrays: One-Dimensional Arrays, Input and Output of Array Values, Array Initialization, Two-Dimensional Arrays, Larger Dimensional Arrays- Matrices

Pointers: Concept of a Pointer, Initialisation of pointer variables, passing by address, Dangling memory, address arithmetic, Dynamic memory management functions, command line arguments.

UNIT-IV:

Modular Programming: Function and Parameter Declarations, Returning a Value, Classifications of Functions, Variable Scope, Variable Storage Class, Local Variable Storage Classes, Global Variable Storage Classes, Pass by Reference, Passing Addresses to a Function, Array as a Function arguments.

Case Study: Recursion - Mathematical Recursion, Recursion versus Iteration

UNIT-V:

Strings & Structures:

Strings: String Fundamentals, String Input and Output, String Processing, Library Functions.

Structures: Derived types, Structures declaration, Initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit-fields.

TEXT BOOKS:

1. ANSI C Programming, Gary J. Bronson, Cengage Learning.
2. Let us C Authentic Guide to C Programming Language by yashavant kanetkar.
3. The C programming Language, Dennis Richie and Brian Kernighan, Pearson Education.

REFERENCE BOOKS:

1. C Programming-A Problem Solving Approach, Forouzan, Gilberg, Cengage.
2. Programming with C, Bichkar, Universities Press.
3. Programming in C, ReemaThareja, OXFORD.
4. C by Example, Noel Kalicharan, Cambridge.

Course Outcomes:

1. Write, compile and debug programs in C language.
2. Use different data types in a computer program.
3. Design programs involving decision structures, loops and functions.
4. Explain the difference between call by value and call by reference
5. Understand the dynamics of memory by the use of pointers
6. Understand the sorting and searching algorithms.

Course Objectives:

The objective of this course is to

- Explain the internal parts of a computer, peripherals, I/O ports, connecting cables
- Demonstrate basic command line interface commands on Linux
- Teach the usage of Internet for productivity and self-paced lifelong learning
- Describe about Compression, Multimedia and Antivirus tools
- Demonstrate Office Tools such as Word processors, Spreadsheets and Presentation tools

Course Outcomes:

Students should be able to:

- Assemble and disassemble components of a PC
- Construct a fully functional virtual machine, summarize various Linux operating system commands,
- Recognize characters & extract text from scanned images, Create audio files and podcasts

Computer Hardware:

Experiment 1: Identification of peripherals of a PC, Laptop, Server and Smart Phones: Prepare a report containing the block diagram along with the configuration of each component and its functionality, Input/ Output devices, I/O ports and interfaces, main memory, cache memory and secondary storage technologies, digital storage basics, networking components and speeds.

Operating Systems:

Experiment 2: Virtual Machine setup: o Setting up and configuring a new Virtual Machine o Setting up and configuring an existing Virtual Machine o Exporting and packaging an existing Virtual Machine into a portable format

Or

Experiment 2: Operating System installation: o Installing an Operating System such as Linux on Computer hardware.

Experiment 3: Linux Operating System commands: o General command syntax o Basic help commands

- Basic File system commands

- Date and Time

- Basic Filters and Text processing

- Basic File compression commands o Miscellaneous: apt-get, vi editor.

Networking and Internet:

Experiment 4: Networking Commands:

- ping, ssh, ifconfig, scp, netstat, ipstat, nslookup, traceroute, telnet, host, ftp, arp, wget, route

Experiment 5: Internet Services:

- Web Browser usage and advanced settings like LAN, proxy, content, privacy, security, cookies, extensions/ plugins o Antivirus installation, configuring a firewall, blocking pop-ups
- Email creation and usage, Creating a Digital Profile on LinkedIn.

Productivity Tools:

Experiment 6: Basic HTML tags, Introduction to HTML5 and its tags, Introduction to CSS3 and its properties. Preparation of a simple website/ homepage,

Assignment: Develop your home page using HTML Consisting of your photo, name, address and education details as a table and your skill set as a list.

Features to be covered:- Layouts, Inserting text objects, Editing text objects, Inserting Tables, Working with menu objects, Inserting pages, Hyper linking, Renaming, deleting, modifying pages, etc.,

Internet of Things (IoT): IoT fundamentals, applications, protocols, communication models, architecture, IoT devices

Office Tools:

Experiment 7: Demonstration and Practice on Text Editors like Notepad++, Sublime Text, Atom, Brackets, Visual code, etc

Experiment 8: Demonstration and practice on Microsoft Word, Power Point, Microsoft Excel

Experiment 9: Demonstration and practice on LaTeX and produce professional pdf documents.

Text Books:

1) Computer Fundamentals, Anita Goel, Pearson Education, 2017 2) PC Hardware Trouble Shooting Made Easy, TMH

References Books:

1) Essential Computer and IT Fundamentals for Engineering and Science Students, Dr.N.B.Vekateswarlu, S.Chand

e-Resources:

1) https://explorersposts.grc.nasa.gov/post631/2006- 2007/computer_basics/ComputerPorts.doc

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Department of Basic Science

Syllabus: I B. Tech-I/II Semester

(R-20 Regulations)

(Common to all circuital branches like ECE, EEE, CSE, IT, AI&DS and AI&ML etc.)

Course Title: Applied Physics Lab

L	T	P	C
0	0	3	1.5

List of Experiments

Conduct 10 out of 15 experiments

1. Determination of wavelength of a source-Diffraction Grating-Normal incidence
2. Newton's rings –Radius of Curvature of Plano Convex Lens.
3. Determination of thickness of a thin object using parallel interference fringes.
4. Determination/ of Rigidity modulus of a material- Torsional Pendulum.
5. Determination of Acceleration due to Gravity and Radius of Gyration- Compound Pendulum.
6. Melde's experiment – Transverse and Longitudinal modes.
7. Verification of laws of stretched string – Sonometer.
8. Determination of velocity of sound – Volume Resonator
9. L C R Series Resonance Circuit
10. Study of I/V Characteristics of Semiconductor diode
11. I/V characteristics of Zener diode
12. Thermistor characteristics – Temperature Coefficient
13. Magnetic field along the axis of a current carrying coil – Stewart and Gee's apparatus.
14. Energy Band gap of a Semiconductor p.n junction.
15. Hall Effect for semiconductor.

REFERENCES:

1. Engineering Physics Lab Manual by Dr.Y. Aparna & Dr.K.Venkateswarao (V.G.S.Book links)
2. Physics Practical Manual, Lorven Publication

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Year/Semester	I B. Tech/I Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	Advanced Python Programming Lab				
Branch	CSE, AI&DS,IT				

Course objectives: To enable students

- Explore basic workflow of learning from data.
- Apply various NumPy and pandas' concepts to preprocess the data.
- Understand data visualization techniques and create reports
- Calculating simple descriptive statistical measures on datasets.
- Using sklearn to get inference from data.

Laboratory Experiments:

1. Live experiment with The Teachable Machine (https://teachablemachine.withgoogle.com/train/)
2. Three components of AI system (Dataset, learning algorithm, prediction)
3. Introduction to Algorithmic or inductive Bias Experiment on the teachable machine
4. Determining the stakeholders - the ethical bias
5. Various types of machine learning. Exploring live tools
6. Making an AI based Game (brief primer on JavaScript, HTML and CSS)
7. Experimentation on Importance of Data Visualization
8. Experimentation on exploring types of data, and corresponding chart and statistic
9. Experiment - Dashboard in Google Data Studio
10. Practice on Python Numpy Library
    a. Different ways to create NumPy arrays
    b. Add, remove, modify elements in an array.
    c. Arithmetic operations on NumPy array
    d. Slicing and iterating of NumPy arrays
    e. Matrix operations on NumPy arrays

11. Practice on Python Pandas Library
    a. Create a data Frame manually
    b. Different ways of importing a data frame
    c. Adding, Deleting, Modifying the rows/columns in a dataframe.

d. Apply functions on dataframe.
e. Iterations on dataframe
f. Accessing the elements from a dataframe
g. Different ways to deal with NA's in dataframe
h. Groupby operations on dataframe
i. Merging dataframes

12. Visualization using Python MatplotLib and Seaborn Libraries
    i) Line Graphs ii) Scatter Plots iii) Histograms iv) Subplots v) Join plots vi) Heatmaps

13. Exploratory Data Analysis on a dataset
14. Applying few sklearn functions on the dataset
15. Train test split
16. Evaluation metrics
17. Cross validation

I B.Tech – II Sem **L T P C**

0 0 0 1.5

Programming for Problem Solving Lab

Course Objectives:

- Understand the basic concept of C Programming, and its different modules that includes conditional and looping expressions, Arrays, Strings, Functions, Pointers Structures.
- Acquire knowledge about the basic concept of writing a program.
- Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
- Use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
- Role of functions involving the idea of Modularity.

Exercise - 1 Basics

a) What is an OS Command, Familiarization of Editors - vi, Emacs
b) Using commands like mkdir, ls, cp, mv, cat, pwd, and man
c) C Program to Perform Adding, Subtraction, Multiplication and Division of two numbers From Command line

Exercise - 2 Basic Math
a) Write a C Program to Simulate 3 Laws at Motion
b) Write a C Program to convert Celsius to Fahrenheit and vice versa

Exercise - 3 Control Flow – I
a)Write a C Program to Find Whether the Given Year is a Leap Year or not.
b)Write a C Program to Add Digits & Multiplication of a number

Exercise – 4 Control Flow – II
a)Write a C Program to Find Whether the Given Number is
    i) Prime Number
    ii) Armstrong Number
b) Write a C program to print Floyd Triangle
c) Write a C Program to print Pascal Triangle

Exercise – 5 Functions
a) Write a C Program demonstrating parameter passing in Functions and returning values.
b) Write a C Program illustrating Fibonacci, Factorial with Recursion without Recursion

Exercise – 6 Control Flow – III
a) Write a C Program to make a simple Calculator to Add, Subtract, Multiply or Divide Using switch...case
b) Write a C Program to convert decimal to binary and hex (using switch call function the function)

Exercise – 7 Functions – Continued

Write a C Program to compute the values of sinx and cos x and e^x values using Series expansion. (use factorial function)

Exercise – 8 Arrays

Demonstration of arrays

a) Search-Linear.

b) Sorting-Bubble, Selection.

c) Operations on Matrix.

Exercises - 9 Structures

a)Write a C Program to Store Information of a Movie Using Structure

b)Write a C Program to Store Information Using Structures with Dynamically Memory Allocation

c) Write a C Program to Add Two Complex Numbers by Passing Structure to a Function

Exercise - 10 Arrays and Pointers

a)Write a C Program to Access Elements of an Array Using Pointer

b) Write a C Program to find the sum of numbers with arrays and pointers.

Exercise – 11 Dynamic Memory Allocations

a) Write a C program to find the sum of n elements entered by the user. To perform this program,allocate memory dynamically using malloc () function.

b) Write a C program to find the sum of n elements entered by the user. To perform this program, allocate memory dynamically using calloc () function.

Understand the difference between the above two programs

Exercise – 12 Strings

a) Implementation of string manipulation operations with library function.

- i) copy
- ii) concatenate
- iii) length
- iv) compare

b) Implementation of string manipulation operations without library function.

- i) copy
- ii) concatenate
- iii) length
- iv) compare

Course Outcomes:

1. Apply and practice logical ability to solve the problem.
2. Understand C programming development environment, compiling, debugging and linking and executing a program using the development environment.
3. Analyzing the complexity of problems, modularize the problems into small modules and then convert them into programs.
4. Understand and apply the inbuilt functions and customized functions for solving the problems.
5. Understand and apply the pointers, memory allocation techniques.

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Department of Basic Science

Syllabus: I B.Tech-II Semester

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(Common to ECE, CE, ME,AI&DS, CS&BS)

Course Title: Environmental Science

Objectives:

To make the student to get awareness on environment, to understand the important of protecting natural recourses, ecosystems for futures generations and pollution causes due to the day to day activates of human life to save Earth from the inventions by the engineers.

UNIT – I: Multidisciplinary nature of Environmental Science and Ecosystems

Definition, Scope and Importance – Sustainability: Need for public awareness-Human population and Environment.

Ecosystems:Concept of an ecosystem. - Structure and function of an ecosystem. -Types of Ecosystem-Forest, Grassland, Desert and Aquatic Ecosystems– Food chains, food webs and ecological pyramids.

UNIT – II: Natural Resources

Forest resources: Use and over – exploitation, deforestation – Timber extraction – Mining, dams and other effects on forest and tribal people

Water resources: Conflicts over water, Dams – benefits and problems

Mineral resources: Use and exploitation, Environmental effects of extracting and using mineral resources.

Energy resources: Growing energy needs, renewable and non-renewable energy sources

Food resources: World food problems.

Land resources: Wasteland reclamation.

Role of an individual in conservation of natural resources.

UNIT – III: Biodiversity and its conservation

Definition, Genetic, species and ecosystem diversity- classification - Value of biodiversity: Consumptive use, Productive use, Social use, Biodiversity at national and local levels. Hot-spots of biodiversity - Threats to biodiversity - Endangered and Endemic species of India – Conservation of biodiversity

UNIT – IV: Environmental Pollution

Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards. Role of an individual in prevention of pollution. Pollution case studies.

Solid Waste Management: Sources, effects and control measures of urban and industrial solid wastes. Bio medical and e-waste management.

Global Environmental Challenges: Global warming and climate change-Acid rains, Ozone layer depletion.

UNIT – V: Social Issues and Environmental Management

Urban problems related to energy -Water conservation, Rain water harvesting-Resettlement and rehabilitation of people. Environmental Protection Act –Air Act –Water Act - Wildlife Protection Act - Forest Conservation Act-Public awareness.

International protocols: Stockholm and Rio Summit, Kyoto protocol and Montreal Protocol.

Impact Assessment and its significance various stages of EIA, Environmental audit, Ecotourism. The student should Visit an Industry / Ecosystem.

Text Books

1. A Textbook of Environmental Studies, Shashi Chawla, TMH, NewDelhi.
2. Textbook of Environmental Studies for Undergraduate Courses by ErachBharucha for University Grants Commission.
3. Environmental Studies, R. Rajagopalan, 2nd Edition, 2011, Oxford UniversityPress

References

1. Environmental Studies, K. V. S. G. Murali Krishna, VGS Publishers,Vijayawada.
2. Text Book of Environmental Studies, DeekshitaDave& P. Udaya Bhaskar, Cengage Learning.
3. Textbook of Environmental Science and Technology – Dr. Anji Reddy, BS Publications.
4. Environment Studies, Anubha Kaushik, C P Kaushik, New Age International Publishers,2014.
5. Environmental Studies, P. N. Palanisamy, P. Manikandan, A. Geetha, and K. Manjula Rani; Pearson Education,Chennai.
6. Environmental Studies, Benny Joseph, Tata McGraw Hill Co, NewDelhi.

Course Outcomes: Students will be able to

1. Articulate the basic structure, functions, and processes of key social systems affecting the Environment.
2. Explain how Natural Recourses should be used.
3. Identify the threats to biodiversity.
4. Understand causes, effects and control measures of Environmental pollution.
5. Gain knowledge about Watershed management and Environmental ethics.Gain a rigorous foundation in various scientific disciplines as they apply to environmental science, such as ecology, evolutionary biology, hydrology, and human behavior.