

Academic Regulations

Program structure & Detailed Syllabus

For

Under Graduate Programme (B.Tech)

COMPUTER SCIENCE & ENGINEERING
(Applicable For Batches Admitted From 2020 – 2021)



VIGNAN'S INSTITUTE OF INFORMATION TECHNOLOGY
(AUTONOMOUS)

DUVVADA - VISAKHAPATNAM – 530 049

(An Autonomous Institute, Accredited by NAAC, Affiliated to JNTUK,
Kakinada, AP)

VIGNAN'S INSTITUTE OF INFORMATION TECHNOLOGY
(AUTONOMOUS)

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VIGNAN'S INSTITUTE OF INFORMATION TECHNOLOGY: VISAKHAPATNAM

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PROGRAM STRUCTURE – VR-20

I Year

I Semester

S. No.	Course Code	Course Title	L	T	P	C
1.	1000201100	Mathematics-I	3	0	0	3
2.	1005201100	Problem Solving and Programming using C	3	0	0	3
3.	1003201101	Engineering Drawing	1	0	4	3
4.	1000201102	Technical English Communication	3	0	0	2
5.	1000201105	Applied Chemistry	3	0	0	3
6.	1000201110	Technical English Communication Lab	0	0	3	1.5
7.	1005201110	Problem Solving and Programming using C Lab	0	0	3	1.5
8.	1000201113	Applied Chemistry Lab	0	0	3	1.5
9.	1000201160	Engineering Exploration	0	0	2	1
10.	1000201120	Game, Sports and Yoga	0	0	4	0
Total Credits						19.5

Legend: L-Lecture; T-Tutorial; P -Practical; C-Credit

I Year

II Semester

S. No.	Course Code	Course Title	L	T	P	C
1.	1005201200	Object Oriented Programming through C++	3	0	0	3
2.	1005201201	Computer Organization	3	0	0	3
3.	1005201202	Web Design	3	0	0	3
4.	1000201104	Mathematics-II	3	0	0	3
5.	1000201204	Applied Physics	3	0	0	3
6.	1005201210	Object Oriented Programming through C++ Lab	0	0	3	1.5
7.	1000201212	Applied Physics Lab	0	0	3	1.5
8.	1005201211	Web Design Lab	0	0	3	1.5
9.	1000201121	Constitution of India	2	0	0	0
Total Credits						19.5

Total Credits (I Year – I&II Sem) = 39

I Year I Semester

VIGNAN'S INSTITUTE OF INFORMATION TECHNOLOGY: VISAKHAPATNAM

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
PROGRAM STRUCTURE – VR-20**

I Year

I Semester

S. No.	Course Code	Course Title	L	T	P	C
1.	1000201100	Mathematics-I	3	0	0	3
2.	1005201100	Problem Solving and Programming using C	3	0	0	3
3.	1003201101	Engineering Drawing	1	0	4	3
4.	1000201102	Technical English Communication	3	0	0	2
5.	1000201105	Applied Chemistry	3	0	0	3
6.	1000201110	Technical English Communication Lab	0	0	3	1.5
7.	1005201110	Problem Solving and Programming using C Lab	0	0	3	1.5
8.	1000201113	Applied Chemistry Lab	0	0	3	1.5
9.	1000201160	Engineering Exploration	0	0	2	1
10.	1000201120	Game, Sports and Yoga	0	0	4	0
Total Credits						19.5

Legend: L-Lecture; T-Tutorial; P -Practical; C-Credit

Course Code	MATHEMATICS -I	L	T	P	C
1000201100		3	1	0	3

COURSE OBJECTIVES:

1. Utilize mean value theorems to find the characteristics of the function and acquire the knowledge maxima and minima of functions of two variables.
2. To discuss higher order differential equations.
3. To discuss Laplace Transform and its properties.
4. To apply Inverse Laplace transform to different types of functions and to solving initial value problems.
5. To construct partial differential equations by eliminating arbitrary constants and functions and to solve first order partial differential equations.

COURSE OUTCOMES:

COs	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Understand the mean value theorems and evaluate maxima and minima of functions of two variables without constraints.	1 2	2 4
CO2	Understand different analytical methods to solve higher order linear differential equations	1 2	2 3
CO3	Understand Laplace transform technique to solve initial and boundary value problems arising in engineering stream.	1 2	2 3
CO4	Understand solution of first order linear partial differential equations	1 2	2 3

UNIT-I

[10 HOURS]

Mean Value Theorems: Rolle's Theorem – Lagrange's Mean Value Theorem – Cauchy's Mean value Theorem. Functions of several variables – Partial derivatives – Total derivatives – Chain rule-Jacobian – Functional dependence – Maxima and Minima of functions of two variables without constraints.

UNIT-II

[8 HOURS]

Linear Differential Equations of Higher Order: Non-homogeneous linear differential equations of second and higher order with constant coefficients with non-homogeneous terms of the type e^{ax} , $\sin ax$, $\cos ax$, x^k , method of variation of parameters.

UNIT- III

[10 HOURS]

Laplace Transforms: Introduction - Laplace transforms of standard functions – Shifting Theorems - Transforms of derivatives and integrals - multiplication by t^n - division by t – Unit step/Heaviside's function - Dirac's Delta Function (or Unit Impulse Function) - Laplace Transform of Periodic Function.

UNIT- IV

[10 HOURS]

Inverse Laplace Transforms –Introduction - Properties – Inverse Laplace by using partial fractions and Convolution theorem - solving initial and boundary value problems by using Laplace Transform.

UNIT- V

[10 HOURS]

Partial Differential Equations of first order: Introduction -Solutions of first order linear (Lagrange) equation and nonlinear (standard type $f(p, q) = 0$, $f(z, p, q) = 0$, $f(x, p) = g(y, q)$ & Clairaut's equations

Text Books:

1. Higher Engineering Mathematics by H.K. Dass, S. Chand Publications.
2. Higher Engineering Mathematics 2e, B. V. Ramana, Tata McGraw Hill Publishing Co. Ltd.

REFERENCE BOOKS

1. Engineering Mathematics, Greenburg, 2nd Ed, Pearson education.
2. Higher Engineering Mathematics – 43rd Edition by Dr. B. S. Grewal, Khanna Publishers, New Delhi.
3. A Text book of Engineering Mathematics, N.P. Bali, Laxmi Publications (P) Ltd.
4. Advanced Engineering Mathematics, Erwin Kreszig, 8thEd, Wiley Student Edition.

Course Code	PROBLEM SOLVING AND PROGRAMMING USING C	L	T	P	C
1005201100		3	0	0	3

COURSE OBJECTIVES:

1. To understand computer programming and its roles in problem solving.
2. To understand and develop well-structured programs using C language.

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Write compile and debug Programs in C language	PO1	1
		PO2	1
		PO3	2
CO2	Use operators, data types and write programs	PO1	3
		PO2	3
CO3	Select the best loop construct for a given problem	PO3	2
CO4	Design and implement C programs	PO1	2
		PO2	3
		PO3	2

UNIT- I

Introduction to computers: Computer systems, computer Languages, computer number systems.

Introduction to C programming: Background and characteristics of C, Flow Charts, algorithms and pseudo code. Structure of a C Program, Input/output Statements in C, writing C programs, compiling and executing C programs. **[6 Hours]**

UNIT- II

Programming Style: Tokens of C, Keywords, Variables, Constants and rules to form variables and constants, Data Types, Declaration of Variables and initialization, Operators, Operator precedence and associativity. Type conversions

Flow of Control: Selection: Two way selection, multi-way selection

Repetition and Unconditional Control Statements: concept of loop ,pre test and post test loops, initialization and updating loops ,while statement, do-while statement, for statements, nested loops, break ,continue, goto. **[10 Hours]**

UNIT- III

Arrays and Strings:

Arrays: One-Dimensional Arrays, Declaration, Array Initialization, Input and Output of Array Values, Two-Dimensional Arrays.

Strings: String Fundamentals, String Input and Output, String manipulation functions.
[8 Hours]

UNIT- IV

Modular Programming:

Function and Parameter Declarations: Function definition, types of functions, declaration and definition of user defined functions, its prototypes and parameters, calling a function. Arrays as Function Arguments, Variable Scope, storage class, recursive functions. .
[7Hours]

UNIT- V

Pointers, Structures, Unions and files:

Pointers: Concept of a Pointer, Initialization of pointer variables, pointers as function arguments, address arithmetic, pointers to pointers, Pointers and arrays, Array of Pointers, parameter passing techniques. Dynamic memory allocation.

Structures and Unions: Structures declaration, Initialization of structures, accessing structures, unions.

Files: Declaring, Opening and closing file streams, Reading from and writing to text files.
[10 Hours]

Text Books:

1. Programming in C, ReemaThareja, and Oxford.
2. The C programming Language, Brain W.kernighan, Dennis Ritchie,2e,pearson
3. C Programming-A Problem Solving Approach, Forouzan, Gilberg, Cengage. Pub. Programming with C, Bichkar, Universities Press.

Reference Books:

1. ANSIC Programming garyJ.Bronson. Cengage learning.
2. Let us 'C' by yashwantkanethkar, BPB Publications, 16 edition.

I Year – I Semester	ENGINEERING DRAWING	L	T	P	C
1003201101		3	0	0	3

COURSE OBJECTIVES:

To introduce the use and the application of drawing instruments and to make the students construct the polygons and curves. To introduce orthographic projections and to project the points and lines parallel to one plane and inclined to other. To make the students draw the projections of the plane and solids inclined to one planes. To make the students draw isometric views of simple objects

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Understand the use of drawing instruments to construct the polygons and curves	1	2
		2	2
		3	1
CO2	Learn the principle of orthographic projections. Draw Orthographic projections of points, lines.	1	2
		2	2
		3	1
		12	1
CO3	Draw the various types of planes and solids its views in different Positions	1	2
		2	2
		3	1
		12	1
CO4	Draw isometric views of simple objects	1	2
		2	2
		3	1
		12	2

UNIT- I

INTRODUCTION TO ENGINEERING DRAWING

[13 Hours]

Polygons– Construction of regular polygons

Curves used in Engineering Practice– Ellipse (General method and oblong Method only), Parabola & Hyperbola (General method only)

Introduction to Scales– Vernier & Diagonal Scales.

UNIT- II

ORTHOGRAPHIC PROJECTIONS

[13 Hours]

Projections of points– Projections of straight line– Line parallel to one plane and perpendicular to other plane– parallel to both the planes.

Projections of straight lines– parallel to one plane and inclined to the other plane.

Straight lines inclined to both the planes.

UNIT- III

PROJECTIONS OF PLANES

[13 Hours]

Regular planes perpendicular/parallel to one plane and inclined to the other reference
Plane inclined to both the reference planes.

UNIT- IV

PROJECTIONS OF SOLIDS

[13 Hours]

Prisms, Pyramids, Cones and Cylinders with the axis inclined to one of the plane only

UNIT- V

ISOMETRIC PROJECTIONS

[13 Hours]

Conversion of Isometric Views to Orthographic Views
Conversion of Orthographic Views to Isometric Views.

Text Books:

1. Engineering Drawing, N. D. Bhatt, Chariot Publications.
2. Engineering Drawing, K. L. Narayana & P. Kannaiah, Scitech Publishers
3. Engineering Drawing and Graphics by K Venugopal, New Age international publications .

Reference Books:

1. Engineering Drawing, Agarwal & Agarwal, Tata McGraw Hill Publishers.
2. Engineering Drawing + AutoCad – K Venugopal, V. Prabhu Raja, New Age.

Course Code	TECHNICAL ENGLISH COMMUNICATION	L	T	P	C
1000201102		2	0	0	2

COURSE OBJECTIVES:

- To introduce students to the specific use of English for Technical Communication.
- To develop the overall English proficiency of students and enable them to function effectively in different professional contexts.
- To strengthen student skills in the areas of reading, writing, listening and speaking and enable them to function effectively in their professional sphere

COURSE OUTCOMES:

CO	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Read, understand and interpret material on Environment, Science and Technology, tourism, Energy Sources, Social Awareness	PO7,PO10,PO6,PO12	
CO2	Analyze the functions of language and grammar in spoken and written forms.	PO10,PO12,PO5	
CO3	Write effectively on various domains.	PO10,PO12	
CO4	Prepare and exhibit oral presentation skills by using ICT.(Individual/Team)	PO10,PO12,PO9,PO5	

**Strength of mapping (Intensity Scale) – 1(Lightly mapped), 2(Moderately mapped), 3(Heavily mapped)

UNIT- I No. of lecture hours: 10

Reading: 1) How to Regain Green Cover 2) Solution to Plastic Pollution

Writing: Functional grammar [articles, prepositions of time, place, direction and movement, verb-tense, subject-verb agreement]

Listening: TED Talk on Water Harvesting (LC) –Answering comprehension-based Qs ~ Listening to improve pronunciation

Speaking: Functional English(LC) ~ Introducing oneself

Activities: Reading Comprehension- Note making while reading 1&2,Letter Writing

UNIT-II No. of lecture hours:10

Reading Texts: 1) The Hubble Telescope 2) Genesis of ISRO

Writing: Writing formal letters ~ Functional grammar ~Modals - Paraphrasing

Listening: Listening to a debate on “ Colonizing the Moon” (LC) ~ Note Taking

Speaking: (LC) Making mini presentations on general topics

Activities:

- Reading Comprehension
- Letter Writing-Formal

Unit-III:

No.of lecture hours: : 10

Reading Texts:1) Southern Splendour 2) Tourism in India: Role in Conflict and Peace

Writing: Paragraph writing ~ Functional grammar [relative pronouns, comparative adjectives, adverbs]

Listening: (LC) Listening comprehension ~ Listening for global meaning ~ Listening for getting at the nuances and the mood of the speaker

Speaking: (LC) Telephonic Skills ~ participating in an interactive video and teleconferencing

Activities:

Reading Comprehension
Paragraph writing
Essay writing

Unit-IV:

No. of lecture hours: 10

Reading Texts: 1) Wind Energy 2) How pertinent is the nuclear option

Writing: Writing a formal E-mail

Speaking: Group Discussion (LC)

Listening: Listening to an Interview (LC) related to the text ~ listening critically for understanding the attitude/tone of the speaker

Activities: Reading Comprehension , Email Writing

Unit-V:

No. of lecture hours: 10

Reading Texts: 1) The Evolution of Media 2) The Top Ten Developments in Journalism in the 2000s

Writing: Interpret graphic tools [tables, pie & bar charts ~ writing an abstract ~ Leveraging ICT for communication ~ Preparing a PPT(LC)

Speaking: Making short presentations [individual/team] with the aid of PPT

Listening: Listening to Situation/Scene ~ Sub skills: Listening to understand one's viewpoint ~Listening to understand speaker's intention ~Listening for local understanding.

Activity:

Information Transfer

Suggested Books:

- Elango, K et.al 2014. *Mindsapes: English for Technologists and Engineers*, Orient Blackswan, Hyderabad.

Reference Books:

- Balasubramanian M. 1985. *Business Communication*. Vani Educational Books, New Delhi

- Balasubramanian T. 1989. *A Text book of Phonetics for Indian Students*. Orient Longman, New Delhi.
- Krishnaswamy, N and Sriraman, T. 1995. *Current English for Colleges*. Macmillan India Ltd. Madras.
- Mohan Krishna and Meera Banerjee. 1990. *Developing Communication Skills*. Macmillan India Ltd. New Delhi.
- Narayanaswamy V R. 1979. *Strengthen your Writing*. Orient Longman, New Delhi.
- Naterop, Jean, B. and Rod Revell. 1997. *Telephoning in English*. Cambridge University Press, Cambridge

Course Code	APPLIED CHEMISTRY	L	T	P	C
1000201105		3	1	3	4.5

Course Objectives:

- **Importance** of usage of plastics in household appliances and automotive industries.
- **Outline** the basics for the construction of electrochemical cells, batteries and fuel cells.
- **Understand** the mechanism of corrosion and how it can be prevented.
- **Express** the increase in demand as wide variety of advanced materials is introduced which have excellent engineering properties.
- **Explain** the structures, bonding and shapes of various octahedral complexes.

	Course outcome	Cognitive Level as per Bloom's Taxonomy	PO
CO1	Identification of different polymers and their functionalities	Level-2,3	PO1, PO2, PO8
CO2	Determination of structure to many compounds and Apply the basic knowledge in construction of cell and its applications	Level-2,3	PO1, PO2
CO3	Analysis of corrosive environments and protection of precious metal	Level-2,3	PO1, PO2, PO8, PO9
CO4	Adoption of different green methodologies for preparation of advanced materials	Level-2,3	PO1, PO2, PO9

UNIT- I

Polymer Chemistry:

Introduction to polymers, Classification of polymers, Types of Polymerizations (Addition, Condensation & copolymerization) with examples, properties of polymers (physical and mechanical).

Plastics - Thermoplastics and Thermosetting plastics, compounding of plastics, Moulding Techniques (Compression & Blow moulding), Preparation, properties and applications of – PVC and Bakelite.

Outcome: After the completion of Unit I, the student will be able to

- Explain the different types of polymers and their applications.
- Explain the preparation, properties and applications of Bakelite & PVC.

Activity:

- Identification and collection of various thermo and thermosetting plastics.

Experiments:

1. Preparation of a polymer (phenol-formaldehyde resin)

UNIT II:

Structure and Bonding Models:

Molecular orbital theory – bonding in homo and hetero nuclear diatomic molecules – energy level diagrams of H_2 , C_2 , N_2 , O_2 and CO , etc. calculation of bond order, shapes of d orbitals, crystal field theory – salient features – Crystal field splitting in octahedral environments, Crystal field stabilization Energy (CFSE) for high spin and low spin octahedral complexes.

Outcome: After the completion of Unit II, the student will be able to

- Illustrate the molecular orbital energy level diagram of different molecular species
- Calculate the bond orders of different molecules.
- Calculate CFSE for different complexes.

Activity:

- Calculation of CFSE for different Complexes (Virtual lab).

Experiments:

1. Determination of Copper by using standard EDTA solution.
2. Determination of Iron (II) by using standard $KMnO_4$ solution.

Unit-III:

Electrochemistry and Applications:

Construction and working of Galvanic cell, Electrode potential, Reference electrodes - Standard hydrogen electrode, Electrochemical series & its applications, pH meter and applications (acid-base titrations), concept of conductivity - conductometric titrations (acid-base titrations)

Batteries: Primary cell – Dry cell (Leclanche cell) and applications, Secondary cells – lead acid battery & applications.

Outcome: After the completion of Unit III, the student will be able to

- Differentiate between pHmetry and conductometric titrations
- Explain the construction of batteries and their applications.

Activity:

- Identification and collection of various types of batteries.

Experiments:

1. pH metric titrations of (i) strong acid vs. strong base.
2. Conductometric titrations - (i) strong acid vs. strong base.
3. Construction & working of Galvanic cell (Virtual lab).
4. Determination of strength of an acid in Pb-Acid battery.

Unit-IV:

Corrosion:

Introduction to corrosion, dry corrosion with mechanism, electrochemical theory of corrosion with mechanism.

Types of Electrochemical corrosion (differential aeration corrosion, galvanic corrosion, pitting corrosion & stress corrosion), protection – cathodic protection, corrosion inhibitors, Cathodic & Anodic coatings, Galvanizing & Tinning.

Outcome: After the completion of Unit IV, the student will be able to

- Discuss different types of protecting methods of metals.
- Demonstrate the corrosion prevention methods.

Activity:

- Collection of various types of corrosive & non corrosive products.

Experiments:

1. Determination of Iron (II) by using standard $K_2Cr_2O_7$ solution.
2. Determination of Zinc (II) by ferrocyanide method.

Unit-V:

Chemistry of Advanced Engineering Materials & Bio Molecules

Nanomaterials: Introduction - Carbon nanotubes: Types, preparation (Electric Arc discharge, Laser ablation and CVD techniques), properties and applications, Fullerenes – structure and applications.

Composites - Fiber reinforced materials – CFRP & GFRP

Biodegradable polymers and its applications

Green Chemistry: 12 Principles only

Nucleic acids: Structure of deoxyribonucleic acid (DNA) and ribonucleic acid (RNA)

Outcome: After the completion of Unit V, the student will be able to

- Explain the different types of Nanomaterials and their applications.
- Apply the principles of polymers in reinforced materials like CFRP & GFRP.
- Acquire knowledge of advanced materials and their applications.

Activity:

- Implementation of any one green principle

Experiments:

1. Preparation of nano materials.

Text Books:

1. Engineering Chemistry by Jain and Jain; Dhanpat Rai Publishing Co.
2. Engineering Chemistry by Shikha Agarwal; Cambridge University Press, 2015 edition.

Reference Books:

1. Engineering Chemistry of Wiley India Pvt. Ltd., Vairam and others, 2014 edition (second).
2. Engineering Chemistry by Prasanth Rath, Cengage Learning, 2015 edition.
3. A text book of engineering Chemistry by S. S. Dara; S. Chand & Co Ltd., Latest Edition
4. Applied Chemistry by H.D. Gesser, Springer Publishers
5. Text book of Nano-science and nanotechnology by B.S. Murthy, P. Shankar and others, University Press, IIM

I Year	TECHNICAL ENGLISH COMMUNICATION LAB	L	T	P	C
1000201110		0	0	3	1.5

COURSE OBJECTIVES:

- To introduce students to the specific use of English for Technical Communication.
- To develop the overall English proficiency of students and enable them to function effectively in different professional contexts.
- To strengthen student skills in the areas of reading, writing, listening and speaking and enable them to function effectively in their professional sphere.

COURSE OUTCOMES:

COs	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Analyze the functions of language and grammar in spoken and written forms.	PO10,PO12, PO5	3
CO2	Write effectively on various domains.	PO10,PO12	3
CO3	Prepare and exhibit oral presentation skills by using ICT.(Individual/Team)	PO10,PO12, PO9,PO5	3

**Strength of mapping (Intensity Scale) – 1(Lightly mapped), 2(Moderately mapped), 3(Heavily mapped)

LIST OF EXPERIMENTS

S.No.	Name of the experiment	Skill
1	Just A Minute –Tell about oneself	Speaking
2	Note Taking	Listening & Writing
3	Interactions	Listening & Speaking
4	Mini Presentation	Speaking
5	Letters and Sounds- Some pronouncing Patterns	Speaking
6	Telephonic Skills	Speaking & Listening
7	Group Discussion	Team work, leadership Speaking
8	Mock-Interview	Speaking
9	Impromptu individual presentations	Speaking
10	Information Transfer	Writing

Text Books:Speak Well-Maruthi Publications

Reference Books:Interact –Orient Blackswan

Course Code	PROBLEM SOLVING AND PROGRAMMING USING C LAB	L	T	P	C
1005201110		0	0	3	1.5

COURSE OBJECTIVES:

1. To understand computer programming and its roles in problem solving.
2. To understand and develop well-structured programs using C language.

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Write compile and debug Programs in C language	PO1	1
		PO2	1
		PO3	2
CO2	Use operators, data types and write programs	PO1	3
		PO2	3
CO3	Select the best loop construct for a given problem	PO3	2
CO4	Design and implement C programs	PO1	2
		PO2	3
		PO3	2

LIST OF EXPERIMENTS

S.No.	Name of the experiment	Skill
1.	Exercise – 1 a) Write a C program to compute perimeter and area of rectangle b) Write a C program to calculate distance between points c) Write a C Program to Simulate 3 Laws of Motion	Input/Output
2.	Exercise – 2 a) Write a C Program to convert Celsius to Fahrenheit and vice versa b) Write a C program to find maximum of three numbers using conditional operator.	Input/Output
3.	Exercise – 3 a) Write a C Program to find Whether the Given Year is a Leap Year or not. b) Write a C Program to find grade of student. c) Write a menu driven program to compute area of different geometrical shapes	Control Statements
4.	Exercises –4 a) Write a C Program to Find Whether the Given Number is i)Strong number ii)perfect number b) Write a C Program to print the following between 1 to n i)Prime Number ii) Armstrong Number	Loops and Control Statements

5.	Exercise -5 Demonstration of arrays& Strings a) Write a C program to perform Linear Search b) Write a C program to perform transpose of two matrices c) Write a C program to perform multiplication of two matrices d) Implementation of string manipulation operations with and without library function. i)copy ii) concatenate iii)length iv)compare	Arrays and Strings
6.	Exercise -6 a) Write a C program to find cube of any number using function. b) Write a c program to find area and volume of geometric shapes using functions. c) Write a C program to check whether a number is even or odd using functions.	Functions
7.	Exercise -7 a) Write a C Program illustrating Fibonacci, Factorial using recursion b) Write a C program to find power of any number using recursion. c) Write a C program to find GCD and LCM using recursion	Recursive Functions
8.	Exercise -8 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. c) Write a c program to illustrate parameter passing techniques	Pointers
9.	Exercise -9 a) Write a C Program to Store Information of a student Using Structures b) Write a C program to create memory for int, char and float variable at run time.	Structures
10.	Exercise -10 a) Write a program in C to copy a file in another name b) Write a C program to append multiple lines at the end of file	Files

Text Books:

1. Programming in C, ReemaThareja, and Oxford.
2. The C programming Language, Brain W.kernighan, Dennis Ritchie,2e,pearson
3. C Programming-A Problem Solving Approach, Forouzan, Gilberg, Cengage. Pub. Programming with C, Bichkar, Universities Press.

Reference Books:

1. ANSIC Programming garyJ.Bronson. Cengage learning.
2. Let us 'C' by yashwantkanethkar, BPB Publications, 16 edition.

Course Code	APPLIED CHEMISTRY - LABORATORY	L	T	P	C
1000201113		0	0	3	1.5

Course objectives:

The student with the knowledge of the basic chemistry will understand and explain scientifically the various chemistry related problems in the industry/engineering and develop experimental skills for building technical competence. The student will be able to understand the new developments and breakthroughs efficiently in engineering and technology. The introduction of the latest (R&D oriented) topics will make the engineering student upgraded with new technologies.

List of Experiments:

Introduction to Chemistry laboratory – Molarity, normality, primary, secondary standard solutions, volumetric titrations, quantitative analysis

1. Determination of Hardness of a groundwater sample.
2. Determination of alkalinity of Water.
3. Determination of Copper using standard EDTA solution.
4. Determination of Zinc (II) by ferrocyanide method.
5. Determination of Iron (II) by using standard KMnO_4 solution.
6. Determination of the Concentration of HCl using Sodium Hydroxide (by pH - metry method).
7. Determination of the Concentration of strong acid vs strong base (by conductometric method)
8. Determination of Iron (II) by using standard $\text{K}_2\text{Cr}_2\text{O}_7$ solution.
9. Preparation of a polymer (phenol-formaldehyde resin).
10. Preparation of Nano materials (Demonstration only)
11. Construction of Galvanic cell (Virtual lab).
12. Determination of strength of an acid in Pb-Acid battery.

*Of the above experiments at-least 10 assessment experiments should be completed in a semester.

Course outcomes:

After the completion of the course the student will

be able to: CO1: Analyze & generate experimental skills.

CO2: Enhance the thinking capabilities in the modern trends of engineering & technology.

CO3: Learn and apply basic techniques used in chemistry laboratory for preparation of Organic Compounds.

CO4: Learn safety rules in the practice of laboratory investigation.

I Year – I Semester	ENGINEERING EXPLORATION	L	T	P	C
1000201160		0	0	3	1

COURSE OBJECTIVES:

To understand the importance of multi-disciplinary Engineering knowledge in the current world, for making any project. To learn Engineering design process for creating any new product/system. To learn the fundamental practical knowledge for starting any inter-disciplinary project.

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Realize the purpose/Role of Engineer for solving social problems	6	3
		7	3
		8	2
		9	2
CO2	Learn to Design a component/system in an engineering way	1	3
		3	3
		9	2
CO3	Learn to use mechanisms, Arduino, sensors, motors.	1	3
		2	2
		5	3
		9	2
CO4	Integrating different systems (mechanical/Electrical/computer) to work as a unit	1	2
		3	3
		5	3
		9	2

UNIT- I

INTRODUCTION TO ENGINEERING AND ENGINEERING STUDY [6 Hours]

Introduction to Engineering, Difference between science and engineering, scientist and engineer, needs and wants various disciplines of engineering, some misconceptions of engineering, Role of engineers in solving social problems, Graduate Attributes.

Activity theme: Activities aimed to understand Engineering

Activities:

1. Identifying Various Engineering disciplines involved in projects/systems
2. Listing down various social problems in the world & Finding how engineering can solve these social problems.

UNIT- II

ENGINEERING DESIGN

[12 Hours]

Engineering Design Process, Multidisciplinary facet of design, Generation of multiple solution, Introduction to Mechatronics systems, Motor and Battery Sizing concepts, Introduction to PCB design.

Activity theme: Activities based on the designing & making of models

Activities:

1. Making of a Popsicle sticks prototype bridge
2. Conversion of AC to DC using bridge rectifier
3. Creation of Mobile App using MIT App Inventor
4. Creating a Full adder circuit using Logic gates with IC's

UNIT- III

MECHANISMS

[6 Hours]

Basic Components of a Mechanism, Degrees of Freedom (Mobility of a Mechanism), 4 Bar Chain, Crank Rocker Mechanism, Slider Crank Mechanism.

Activity theme: Creating a model which illustrate any mechanism

Activities:

1. Determining the number of Degrees of freedom for a given mechanism
2. Assembly of scissors mechanism

UNIT- IV

PLATFORM BASED DEVELOPMENT

[8 Hours]

Introduction to platform-based development (Arduino) programming and its essentials, Introduction to sensors, transducers and actuators and its interfacing with Arduino.

Activity theme: To Program Arduino to control lights, Motors, Sensors etc.

Activities:

1. Blinking LEDs using Arduino interface
2. Identifying the objects with Infrared sensor
3. Usage of different sensors using Arduino Interface

UNIT- V

DATA ACQUISITION AND ANALYSIS

[8 Hours]

Types of Data, Descriptive Statistics techniques as applicable to different types of data, Types of graphs as applicable to different types of data, Usage of Microsoft Excel tool for descriptive statistics, Data Acquisition using Sensors interfaced with Arduino, exporting acquired data to Microsoft Excel and analysis using visual representation.

Activity theme: Acquiring data from sensors using Arduino

Activities:

1. Data analysis of Ultrasonic sensor with Arduino as interface
2. Data analysis of DHT sensor with Arduino as interface

I Year II Semester

VIGNAN'S INSTITUTE OF INFORMATION TECHNOLOGY: VISAKHAPATNAM

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
PROGRAM STRUCTURE – VR-20**

I Year

II Semester

S. No.	Course Code	Course Title	L	T	P	C
11.	1005201200	Object Oriented Programming through C++	3	0	0	3
12.	1005201201	Computer Organization	3	0	0	3
13.	1005201202	Web Design	3	0	0	3
14.	1000201104	Mathematics-II	3	0	0	3
15.	1000201204	Applied Physics	3	0	0	3
16.	1005201210	Object Oriented Programming through C++ Lab	0	0	3	1.5
17.	1000201212	Applied Physics Lab	0	0	3	1.5
18.	1005201211	Web Design Lab	0	0	3	1.5
19.	1000201121	Constitution of India	2	0	0	0
Total Credits						19.5

Total Credits (I Year – I&II Sem) = 39

Course Code	OBJECT ORIENTED PROGRAMMING THROUGH C++	L	T	P	C
1005201200		3	0	0	3

COURSE OBJECTIVES:

3. To understand how C++ improves C with object-oriented features
4. To learn the syntax and semantics of the C++ programming language.
5. To learn how containment and inheritance promote code reuse in C++.
6. To learn how inheritance and virtual functions implement dynamic binding with polymorphism.
7. To learn how to design and implement generic classes with C++ templates

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Articulate the principles of object-oriented programming and Outline the essential features and elements of the C++ programming language.	PO1	1
CO2	Apply the concepts of class, method, constructor, instance, data abstraction, function abstraction, inheritance, overriding, overloading, and polymorphism.	PO1 PO2	3 3
CO3	Apply virtual and pure virtual function in complex programming situations	PO1 PO2	2 3
CO4	To use template classes and the STL library in C++ and to incorporate exception handling in object oriented concepts	PO2	3

UNIT- I

INTRODUCTION TO C++

Difference between C and C++- Evolution of C++- The Object Oriented Technology- Disadvantage of Conventional Programming- Key Concepts of Object Oriented Programming- Advantage of OOP- Object Oriented Language. **[6 Hours]**

UNIT- II

CLASSES AND OBJECTS & CONSTRUCTORS AND DESTRUCTOR

Classes in C++ - Declaring Objects- Access Specifiers and their Scope- Defining Member Function Overloading Member Function- Nested class. Introduction to Constructors and Destructor- Characteristics of Constructor and Destructor-Types of Constructor - Anonymous Objects. **[8 Hours]**

UNIT- III

OPERATOR OVERLOADING AND TYPE CONVERSION & INHERITANCE

The Keyword Operator- Overloading Unary Operator- Operator Return Type- Rules for Overloading Operators, Overloading Assignment Operator (=). Inheritance, Types of Inheritance. Virtual Base class, object as class member, abstract classes. [8Hours]

UNIT- IV

POINTERS & BINDING POLYMORPHISMS AND VIRTUAL FUNCTIONS

Pointer, Features of Pointers- Pointer Declaration- Pointer to Class- Pointer Object- this Pointer- Pointer to Derived Classes and Base Class, Binding Polymorphisms and Virtual Functions, Introduction- Binding in C++ - Virtual Functions- Rules for Virtual Function- Virtual Destructor. [8Hours]

UNIT- V

GENERIC PROGRAMMING WITH TEMPLATES & EXCEPTION HANDLING

Generic Programming with Templates, Need for Templates- Definition of class Templates- Normal Function Templates- Overloading of Template Function-Bubble Sort Using Function Templates. Introduction to Standard Template Library: list-set-vector-map-deque. Introduction to Exception Handling: keywords try, throw and catch, multiple catch statements specifying exceptions. [10 Hours]

Text Books:

1. Programming in C++, Ashok N Kamathane, Pearson 2nd Edition.
2. The Complete Reference C++, Herbert Schildt, TMH.

Reference Books:

4. Object Oriented Programming C++, Joyce Farrell, Cengage.
5. C++ Programming: from problem analysis to program design, DS Malik, CengageLearning.
6. Computer Programming with C++,kunalPimparkhede, cambridge

CourseCode:	COMPUTER ORGANIZATION	L	T	P	C
1005201201		3	0	0	3

Course Description and Objectives:

The course aims to teach a student the fundamental components used in a Digital Computer and its functioning.

Course Outcomes:

	Course outcome	Skill	PO
CO1	Identify the logic gates and their functionality and performing conversions from one system to another system	Remember/Understand/Apply	PO1,PO2,PO3
CO2	Design basic electronic circuits (combinational circuits).	Apply	PO2, PO3,PO5
CO3	The basic components of a computer, including CPU, memories, and input/output and their organization representation of data, addressing modes, instruction sets.	Apply/Understand	PO2, PO3,PO5
CO4	Extrapolate memory organization and input, output organizations	Create	PO2,PO3,PO4,PO5,PO12

Syllabus**UNIT – 1**

NUMBER SYSTEM AND CODES: Decimal Numbers, Binary Numbers, Decimal to binary Conversions, Binary Arithmetic, 1's and 2's complements of Binary Numbers, Signed Numbers, Arithmetic Operations with Signed numbers, Hexadecimal Numbers, Octal Numbers.

LOGIC GATES: The Inverter, The AND gate, The OR gate, The NAND gate, NOR gate, The Exclusive-OR gate and Exclusive-NOR gate; Boolean Algebra and Logic Simplification - Boolean Operations and Expressions, Laws and Rules, DeMorgan's Theorems, Boolean Expressions and Truth tables. **[15 Hours]**

UNIT – 2

COMBINATIONAL LOGIC ANALYSIS: Basic combinational Logic Circuits, Implementing Combinational Logic, The Universal Property of NAND and NOR Gates. Functions of Combinational Logic - Basic Adder, Parallel Binary Adders, Comparators, Decoders, Encoders.

Basic Structure Of Computers: Functional unit, Basic Operational concepts, Bus structures, System Software, Performance, The history of computer development. **[15 Hours]**

UNIT – 3

Machine Instruction and Programs: Instruction and Instruction Sequencing: Register Transfer Notation, Assembly Language Notation, Basic Instruction Types, Addressing Modes, Basic Input/output Operations, The role of Stacks and Queues in computer programming equation.

Type of Instructions: Arithmetic and Logic Instructions, Branch Instructions, Addressing Modes, Input/output Operations [12

Hours]

UNIT – 4

INPUT/OUTPUT ORGANIZATION: Accessing I/O Devices, Interrupts: Interrupt Hardware, Enabling and Disabling Interrupts, Direct Memory Access, Buses: Synchronous Bus, Asynchronous Bus. [10

Hours]

UNIT - 5

MEMORY AND STORAGE: Memory Basics, The RAM, The ROM, Programmable ROMs, The Flash Memory, Memory Expansion, Special Types of Memories, Magnetic and Optical Storage. [10

Hours]

Text Book:

1. Floyd, Thomas L, “Digital Computer Fundamentals”, 10th Edition, University Book Stall, 1997.
2. Computer Organization, Carl Hamacher, ZvonksVranesic, SafeaZaky, 5th Edition, McGraw Hill.
3. Computer Architecture and Organization , John P. Hayes ,3rd Edition, McGraw Hill.

Reference Books:

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI
2. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson
3. Fundamentals or Computer Organization and Design, - SivaraamaDandamudi SpringerInt. Edition.

Course Code	WEB DESIGN	L	T	P	C
1005201202		3	0	0	3

COURSE OBJECTIVES:

1. To understand computer programming and application software, package/ suites.
2. Design static web application development and Students will gain the skills and front designs.
3. Able to get project based experience needed for entry into web application and development careers.

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Understand the various applications and computer programming languages purpose.	PO1	1
CO2	Describe the basic concepts of client server application and WWW	PO1 PO2	1 1
CO3	Describe the basic concepts of HTML & CSS to design web pages and web site	PO2 PO3 PO11 PO12	1 2 2 2
CO4	Analyze a given problem and apply requisite appropriate tools for designing interactive web applications	PO2 PO3 PO11 PO12	1 2 2 2

UNIT- I

INTRODUCTION

[8 Hours]

Types of computer applications (Console, Window, web based mobile and cloud applications). Brief History of Internet, What is World Wide Web, Why create a web site, Web Standards. About Client and server process.

Introduction to HTML: History of HTML, What are HTML Tags and Attributes? HTML Tag vs. Element, HTML Attributes. Basic Syntax, Standard HTML Document Structure

UNIT- II

HTML Tags:

[10 Hours]

Basic Text Markup, Text formatting tags, Heading types, font tag, Images, image map, Hypertext Links, navigating web pages. What is Lists and various types of list, design the Tables using table tag.

UNIT- III

USER INTERACTIVE WEB PAGE

[10 Hours]

Form tag, user interactive components, Text box, label, text area, check box, radio button,

drop down box, submit and reset. **Frames:** Importance of frames, divide the web browser window into different sections. Introduction to HTML5.

UNIT- IV

Cascading Style Sheets:

[8 Hours]

Creating Style Sheet ,CSS Properties, Types of CSS, CSS Styling(Background, Text Format, Controlling Fonts) Working with block elements and objects, Working with Lists and Tables, CSS Id and Class.

UNIT- V

Scripting Languages:

[10 Hours]

Introduction to Client side and server side scripting languages.

Java Script: Variables, arrays, decision control and loop statements, Functions.

Introduction to PHP script and working with get and post methods.

Text Books:

1. Programming the World Wide Web, Robert W Sebesta, 7ed, Pearson.
2. Web Technologies, Uttam K Roy, Oxford
3. The Web Warrior Guide to Web Programming, Bai, Ekedahl, Farrell, Gosselin, Zak, Karparhi, MacIntyre, Morrissey, Cengage

Reference Books:

1. Web Technologies, HTML, JavaScript, PHP, Java, JSP, XML and AJAX, Black book, Dream Tech.
2. An Introduction to Web Design, Programming, Paul S Wang, Sanda S Katila, Cengage Learning

Course Code	MATHEMATICS - II	L	T	P	C
1000201104		3	0	0	3

COURSE OBJECTIVES:

1. To familiarize the students with numerical methods of solving the non-linear equations, Interpolation, Numerical differentiation and integration.
2. Course will illuminate the student in the standard concepts of Linear algebra.
3. Methods to solving system of linear equations and compute Eigen values & Eigen vectors of a real matrix.
4. To apply mathematical statements, ideas and results, with the correct use of mathematical definitions.

COURSE OUTCOMES:

COs	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	<i>Compute</i> approximate roots of an equation by using different numerical methods.	1	1
		2	2
CO2	<i>Explain</i> difference operators and find the relation among operators and apply forward and backward formulas for compute interpolating polynomial.	1	2
		2	2
		3	3
CO3	<i>Apply</i> different numerical methods to solve integrations and ordinary differential equations.	1	1
		2	2
		3	3
CO4	<i>Understand</i> to solve the system of Linear equations by direct and iteration methods, and compute eigen values and eigen vectors of a matrix and study the nature of Quadratic form.	1	1
		2	2
		3	3

UNIT- I

Numerical Solution of Algebraic and Transcendental Equations:

[8 Hours]

Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method.

UNIT- II

Interpolation:

[8 Hours]

Introduction– Forward Difference, Backward difference, Central difference operators – Newton's formulae for interpolation – Gauss' Central Difference Formulae –Interpolation with unevenly spaced points-Lagrange's Interpolation formula.

UNIT- III

Numerical Integrations & Differential Equations: [8 Hours]

Numerical Integration: – Trapezoidal rule – Simpson's $1/3^{\text{rd}}$ Rule – Simpson's $3/8^{\text{th}}$ Rule.

Numerical solution of Ordinary Differential equations: Solution by Taylor's series method - Euler's method - Modified Euler's method- Runge-Kutta Method of 4^{th} order.

UNIT- IV

Linear system of equations: [8 Hours]

Introduction-Rank-Echelon Form- Normal Form - System of Linear equations - Homogeneous and Non-Homogeneous , Consistency of system of Linear equations - Gauss elimination - Gauss Seidel method.

UNIT- V

Eigen values, Eigen vectors: [10 Hours]

Introduction - Eigen values - Eigen vectors - Properties - Cayley Hamilton theorem (without proof) - Inverse and power of a matrix by using Cayley Hamilton theorem, Reduction of Quadratic form to canonical form by using orthogonal reduction – Rank, index, signature and Nature of quadratic form.

TEXT BOOKS

1. Higher Engineering Mathematics by H.K. Dass, S. Chand Publications.
2. Higher Engineering Mathematics 2e, B. V. Ramana, Tata McGraw Hill Publishing Co. Ltd.

REFERENCE BOOKS

1. Engineering Mathematics, Greenburg, 2nd Ed, Pearson education.
2. Higher Engineering Mathematics – 43rd Edition by Dr. B. S. Grewal, Khanna Publishers, New Delhi.
3. A Text book of Engineering Mathematics, N.P. Bali, Laxmi Publications (P) Ltd.
4. Advanced Engineering Mathematics, Erwin Kreszig, 8thEd, Wiley Student Edition.

E-Books: (Specify links)

NPTEL/MOOC: (Specify Links)

I Year – I Semester	APPLIED PHYSICS	L	T	P	C
1000201204		3	0	0	3

COURSE OBJECTIVES:

To introduce the basic concepts of physical optics phenomenon such as interference, diffraction and polarization. Understanding of the concepts found in semiconductor physics and provide an insight into semiconductor devices.

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Describe the wave phenomena and formation of Newton's rings.	1	2
		2	2
		9	1
		12	1
CO2	Make use of the concepts of pumping and total internal reflection to set up lasers and optical fibers.	1	2
		2	2
		3	1
		9	1
		12	1
CO3	Apply basic knowledge of energy bands in crystalline solids to understand semiconductor physics.	1	3
		2	2
		9	1
CO4	Identify the importance of semiconductor physics for construction and working of diode, transistors and logic gates.	1	3
		2	2
		9	1

UNIT- I

INTERFERENCE

[8 Hours]

Introduction-Principle of Superposition – Interference-Conditions for sustained interference– Coherent Sources – Interference in thin films (reflection geometry) – Newton's rings – Applications of interference.

UNIT- II

DIFFRACTION & POLARIZATION

[10 Hours]

Introduction – Difference between interference and diffraction – Difference between Fresnel and Fraunhofer diffraction - Fraunhofer diffraction at single slit- cases – Diffraction grating and grating equation.

Introduction to polarization-Double refraction – Types of Polarization -Quarter wave plate - Half Wave plate.

UNIT- III

LASERS & FIBER OPTICS

[10 Hours]

Introduction-Characteristics of laser light – stimulated absorption, spontaneous and stimulated emission of radiation – population inversion (2-level, 3-level and 4-level schemes) - Einstein coefficients and significance– basic components of laser - Ruby laser – He- Ne laser and applications of lasers.

Introduction and principle of optical fiber – acceptance angle - numerical aperture - Applications of optical fibers.

UNIT- IV

SEMICONDUCTOR PHYSICS & DEVICES

[12 Hours]

Introduction - bond formation in intrinsic semiconductors and extrinsic semiconductors (P-type and N-type) – intrinsic electrical conductivity – Drift & Diffusion – Einstein's equation – Hall effect in semiconductors – Applications of Hall effect.

Introduction to Diodes: p-n junction diode – Volt- ampere characteristics of p-n junction diode – Zener diode – Volt- ampere characteristics of Zener diode – Zener diode as voltage regulator-Solar Cell (qualitative).

UNIT- V

INTRODUCTION TO DIGITAL ELECTRONICS

[12 Hours]

Logic gates (OR gate, AND gate, NOT gate, NAND gate, NOR gate, XOR gate), Two level implementations: And Or Inverter (AOI), Or And Inverter (OAI), Demorgan's theorems, Boolean Expressions with Truth Tables, Product of literals (Min term), Sum of literals (Max term), Sum of products, Product of sums, Laws of Boolean algebra, Half adder and Full adder circuits with truth tables.

Text Books:

4. L.M. Pedrotti, Introduction to Optics, Prentice-Hall International, Inc. (1993)
5. Arthur Beiser, Concepts of Modern Physics, McGraw-Hill Science (2003)
6. Resnick, Halliday, Krane, Physics Vol 1 & 2 (5ed), Wiley, Fifth edition (2007)
7. A.P. Malvino, D.P. Leach, Digital Principles and Applications, Tata McGraw Hill Education Pvt. Ltd. (1995)
8. A. J. Dekker, Solid State Physics, Macmillan India Pvt. Ltd., (2011)
9. C. Kittel, Introduction to Solid State Physics, Wiley India Pvt. Ltd, (2012)
10. S. M. Sze, Physics of Semiconductor Devices, 3rd edition, John Wiley & Sons, (2007)
11. M. A. Wahab, Solid State Physics: Structure And Properties Of Materials, Narosa Publishing House Pvt. Ltd. (2005)
12. Joseph Lindmayer, Charles Y. Wrigly, Fundamentals of Semiconductor Devices, Litton Educational Publishing Inc. (1966)
13. Physics of Semiconductor Devices by S.M.Sze, John Wiley & Sons, New Delhi. (2012)

Reference Books:

3. Dr. M. N. Avadhanulu and Dr. P. G. KshiraSagar, A Text Book of Engineering Physics, S.Chand& Company Ltd., (2014).
4. David J. Griffiths · Darrell F. Schroeter, Introduction to Quantum Mechanics, Cambridge University Press; 3 edition, (2018).
5. David. J. Giffiths, Introduction to Electrodynamics, Pearson Education India Learning Private Limited; 4 edition (2015).
6. A.K. Sharma, Semiconductor Electronics ,New Age International (P) Limited Publisher, New Delhi. (2011)

E-Books: (Specify links)

NPTEL/MOOC: (Specify Links)

Course Code	OBJECT ORIENTED PROGRAMMING THROUGH C++ LAB	L	T	P	C
1005201210		0	0	3	1.5

COURSE OBJECTIVES:

1. To strengthen problem solving ability by using the characteristics of an object-oriented approach.
2. To design applications using object oriented features
3. To handle Exceptions in programs.
4. To teach the student to implement object oriented concepts

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Create simple programs using classes and objects in c++ and implement object oriented programs in c++	PO2	3
CO2	Implement object oriented programs using templates and exception handling mechanisms	PO2	3
CO3	Implement programs using STL	PO2 PO3	3 3

LIST OF EXPERIMENTS

S.No.	Name of the experiment	Skill
1.	Exercise – 1 (Basics) d) Write a Simple Program on printing “Hello World” and “Hello Name” where name is the input from the user e) Write a C++ program to find both the largest and smallest number in a list of integers f) Write a C++ program to find the sum of individual digits of a positive integer	Input/output
2.	Exercise – 2 c) Write a program to implement call by value and call by reference using reference variable. d) Write a program to illustrate scope resolution, new and delete Operators.	Parameter passing techniques, Dynamic Memory Allocation
3.	Exercise – 3 d) Write a program illustrating Inline Functions e) Write a program illustrates function overloading. Write 2 overloading functions for power. f) Write a program illustrates the use of default arguments for simple interest function.	Functions
4.	Exercises –4 c) Write a program for illustrating Access Specifiers public, private, protected	Access Specifiers

	d) Write a program implementing Friend Function e) Write a program to illustrate this pointer	
5.	Exercise -5 e) Write a program to Overload Unary, and Binary Operators as Member Function, and Non Member Function. f) Write a c ++ program to implement the overloading assignment = operator	Operator Overloading
6.	Exercise -6 a) Write C++ Programs and incorporating various forms of Inheritance i) Single Inheritance ii) Hierarchical Inheritance iii) Multiple Inheritances iv) Multi-level inheritance v) Hybrid inheritance b) Write a Program in C++ to illustrate the order of execution of constructors and destructors in inheritance	Inheritance
7.	Exercise -7 a) Write a program to illustrate runtime polymorphism b) Write a program illustrates pure virtual function and calculate the area of different shapes by using abstract class.	Polymorphism
8.	Exercise -8 a) Write a C++ Program to illustrate template class b) Write a Program to illustrate class templates with multiple parameters c) Write a Program to illustrate member function templates	Templates
9.	Exercise -9 a) Write a Program to implement List and List Operations. b) Write a Program to implement Vector and Vector Operations. c) Write a Program to implement Deque and Deque Operations. d) Write a Program to implement Map and Map Operations. e) Write a Program to implement set and set Operations.	STL
10.	Exercise -10 c) Write a Program Containing a Possible Exception. Use a Try Block to Throw it and a Catch Block to Handle it Properly. d) Write a Program to Demonstrate the Catching of All Exceptions.	Exception Handling

Text Books:

1. The Complete Reference C++, Herbert Schildt, TMH.
2. Programming in C++, Ashok N Kamathane, Pearson 2nd Edition.

Reference Books:

1. Object Oriented Programming C++, Joyce Farrell, Cengage.
2. C++ Programming: from problem analysis to program design, DS Malik, CengageLearning.
3. Computer Programming with C++,kunalPimparkhede,cambridge

I Year – I Semester	APPLIED PHYSICS LABORATORY	L	T	P	C
1000201212		0	0	3	1.5

COURSE OBJECTIVES:

To study the interference, diffraction patterns and characteristics of PN, Zener, thermistor, laser, optical fiber, solar cells and semiconductors. Apply the analytical techniques and graphical analysis to the experimental data.

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Demonstrate the formation Newton's rings, diffraction pattern using grating	1	3
		2	3
		5	1
		9	1
		12	1
CO2	Analyze the voltage vs. current characteristics of PN, Zener diode and solar cell	1	3
		2	3
		5	1
		9	1
		12	1
CO3	Study the characteristics of Laser, optical fiber and thermistor	1	3
		2	3
		5	1
		9	1
CO4	Identify the type of semiconductor and estimation of carrier concentration	1	3
		2	3
		5	1
		9	1

LIST OF EXPERIMENTS

S.No.	Name of the experiment	Skill
1	Newton's rings	Determination of radius of curvature of the lens
2	Interference by wedge shaped film using thin wire	Determination of thickness of a thin wire
3	diffraction by grating	Determination of wavelength of light
4	Laser light diffraction by grating	Determination of wavelength of laser light
5	Laser beam divergence	Determination of laser beam divergence and spot size
6	Numerical aperture of optical fiber	Determination of numerical Aperture of optical fiber
7	Bending losses of Optical fibers	Determination of bending losses of optical

		fiber
8	Hall effect	Identification of semiconductor type and determination of Hall coefficient and carrier concentration
9	Thermistor characteristics	Determination of temperature coefficient of given thermistor
10	pn junction diode	Study of V-I characteristics of pn junction diode
11	Zenerdiode	Determination of breakdown voltage of Zener diode
12	solar cell	Study of V-I characteristics of solar cell

Text Books:

1. C.L. Arora, Practical physics, S. Chand Publication
2. B.L. Worsnop and H. T. Flint, Advanced Practical Physics, Asia Publishing House

Reference Books:

1. P.K. Mittal, N. H. Ayachit, Engineering Physics: With Laboratory Manual, Wiley India.

Course Code	WEB DESIGN LAB	L	T	P	C
1005201211		0	0	3	1.5

COURSE OBJECTIVES:

1. To understand computer programming and application software, package/ suites.
2. Design static web application development and Students will gain the skills and front designs.
3. Able to get project based experience needed for entry into web application and development careers.

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Understand the usage and designing of web pages using HTML & CSS	PO1	1
CO2	Able to design the user interactive pages and web page layouts	PO2 PO3	2 2
CO3	Analyze a given problem and apply requisite appropriate tools for designing interactive web applications	PO5 PO11 PO12	2 3 2

LIST OF EXPERIMENTS

S.No.	Name of the experiment	Skill
1.	Exercise – 1 Design Web page to illustrate the following <ul style="list-style-type: none"> • Title of web page • Heading styles • Various Text formatting tags 	Web Page Design
2.	Exercise – 2 Design Web page to illustrate the following <ul style="list-style-type: none"> • Apply font tag to the text • Upload and resize the image • Implement Image maps 	Web Page Design
3.	Exercise – 3 Design Web page to illustrate the following <ul style="list-style-type: none"> • Various List types • Display the class time table using table tag 	Web Page Design
4.	Exercise – 4 Design Web page to illustrate the following <ul style="list-style-type: none"> • Web page navigation (self and new page) • Implement image as web page navigation 	Web Page Design
5.	Exercise – 5	CSS

	Implement the various CSS <ul style="list-style-type: none"> • Inline CSS • Internal CSS • External CSS 	
6.	Exercise – 6 Design the Login and Registration forms and apply CSS	Web Page Design
7.	Exercise – 7 Java script to implement decision control and loop statements	Web Page Design
8.	Exercise – 8 Java script to implement functions concepts	Scripting
9.	Exercise – 9 Login form validation using java script	Validation
10.	Exercise – 10 Working with get and post method mechanism to interact server using PHP script	Web Page Design

Text Books:

1. Programming the World Wide Web, Robert W Sebesta, 7ed, Pearson.
2. Web Technologies, Uttam K Roy, Oxford
3. The Web Warrior Guide to Web Programming, Bai, Ekedahl, Farrell, Gosselin, Zak, Karparhi, MacIntyre, Morrissey, Cengage

Reference Books:

1. Web Technologies, HTML< JavaScript, PHP, Java, JSP, XML and AJAX, Black book, Dream Tech.
2. An Introduction to Web Design, Programming, Paul S Wang, Sanda S Katila, Cengage Learning

Course Code	CONSTITUTION OF INDIA (Audit Course)	L	T	P	C
1000201121		2	0	0	0

COURSE OBJECTIVES:

To provide basic information about Indian constitution. To identify individual role and ethical responsibility towards society. Introduction to the Constitution of India, The Making of the Constitution and Salient features of the Constitution. Preamble to the Indian Constitution Fundamental Rights & its limitations.

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Understand the importance of constitution, fundamental rights and duties	8	1
CO2	Understand the structure of executive, legislature and judiciary	8	1
CO3	Understand the autonomous nature of constitutional bodies like Supreme Court and high court controller and auditor general of India and election commission of India.	8	1
CO4	Understand the central and state relation financial and administrative.	8	1

UNIT- I

Introduction to Indian Constitution: Constitution' meaning of the term, Indian Constitution - constitutional history, Features - Citizenship, Preamble, Fundamental Rights and Duties

LEARNING OUTCOMES: After completion of this unit student will

- Understand the concept of Indian constitution
- Apply the knowledge on directive principle of state policy
- Analyze the History, features of Indian constitution
- Evaluate Preamble Fundamental Rights and Duties

UNIT- II

.Union Government and its Administration Structure of the Indian Union. President: Role, power and position, PM and Council of ministers, ,LokSabha, RajyaSabha, The Supreme Court and High Court: Powers and Functions;

LEARNING OUTCOMES:-After completion of this unit student will

- Understand the structure of Indian government
- Differentiate between the state and central government
- Explain the role of President and Prime Minister
- Know the Structure of supreme court and High court

UNIT- III

State Government and its Administration Governor - Role and Position - CM and Council of ministers, State Secretariat: Organisation, Structure and Functions

LEARNING OUTCOMES:-After completion of this unit student will

- Understand the structure of state government
- Analyze the role Governor and Chief Minister
- Explain the role of state Secretariat
- Differentiate between structure and functions of state secretariate

UNIT- IV

A.Local Administration - District's Administration Head - Role and Importance, Municipalities - Mayor and role - CEO of Municipal Corporation PachayatiRaj: Functions ZilaPanchayat, CEO ZilaPanchayat

LEARNING OUTCOMES:-After completion of this unit student will

- Understand the local Administration
- Compare and contrast district administration role and importance
- Analyze the role of Myer and elected representatives of Municipalities
- Evaluate Zillapanchayat block level organisation

UNIT- IV

Election Commission: Election Commission- Role of Chief Election Commissioner and Election Commissionerate State Election Commission;

LEARNING OUTCOMES:-After completion of this unit student will

- Know the role of Election Commission apply knowledge
- Contrast and compare the role of Chief Election commissioner and Commissiononerate
- Analyze role of state election commission

Evaluate various commissions of viz SC/ST/OBC and women

Text Books:

1. Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt.Ltd.. New Delhi
2. SubashKashyap, Indian Constitution, National Book Trust
3. J.A. Siwach, Dynamics of Indian Government & Politics
4. D.C. Gupta, Indian Government and Politics
5. H.M.Sreevai, Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication)
6. J.C. Johari, Indian Government andPolitics Hans
7. J. Raj IndianGovernment and Politics
8. M.V. Pylee, Indian Constitution Durga Das Basu, Human Rights in Constitutional Law, Prentice – Hall of India Pvt. Ltd.. New Delhi
9. Noorani, A.G., (South Asia Human Rights Documentation Centre), Challenges to Civil Right), Challenges to Civil Rights Guarantees in India, Oxford University Press 2012

E Resources

1. nptel.ac.in/courses/109104074/8
 2. nptel.ac.in/courses/109104045/
 3. nptel.ac.in/courses/101104065/
 4. www.hss.iitb.ac.in/en/lecture-details
- www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indian-constitution