Program Syllabus Booklet

Bachelor of Technology in Computer Science & Engineering

(B.TECH CSE-102)

Session: 2017-18

Guru Gobind Singh College of Engineering& Technology
Guru Kashi University, Talwandi Sabo

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Introduction about Program

In order to make a career in the field of computer engineering, the candidates must pursue Bachelor of Technology (B.Tech) in Computer Engineering. Students who have qualified 10+2 with Physics and Maths or equivalent are eligible to pursue this course. The students with a Diploma in Engineering with a minimum of 60% marks are also eligible to get admissions in B.Tech program as a lateral entry.

Computer Science is a very vast discipline. The course trains the students of the basics and different aspects of computer engineering. It includes foundations of computer systems, computer architecture & organization, networking, the theory of computation, database systems, electronics, operating systems, programming and website designing, e-commerce & multimedia applications, principles of programming languages, software engineering, hardware engineering, etc. After completion of course, the salary package offered by employers range from Rs. 10 lakh to Rs. 30 lakh per annum. Students also have an option of appearing for GATE exam whose scorecard is evaluated by various government organizations for recruitment. Computer engineers can also get numerous jobs in the private firms and top companies like TCS, Wipro, Microsoft, Google, Infosys, Accenture, HCL, Facebook, Cognizant, Adobe, Oracle, Sun Microsystems, Flipkart, IBM, etc

Annexure-2

Semester: 1st (Physics Group)										
Sr	Course Code	Course Name	Type of Subject T/P	(Hours Per Week)			No. of Credits	Internal Marks	External Marks	Total Marks
				L	T	P				
1	100101	Communicative English	T	3	0	0	3	50	50	100
2	100103	Engineering Mathematics-I	T	4	1	0	5	50	50	100
3	100104	Engineering Physics	T	3	1	0	4	50	50	100
4	102101	Fundamentals of Computer Programming & Information Technology	T	3	0	0	3	50	50	100
5	104101	Basic Electronics & Communication Engineering	T	3	1	0	4	50	50	100
6	100105	Communicative English Laboratory	P	0	0	2	1	60	40	100
7	100107	Engineering Physics Laboratory	P	0	0	2	1	60	40	100
8	102102	Fundamentals of Computer Programming & Information Technology Lab	P	0	0	4	2	60	40	100
9	104102	Basic Electronics & Communication Engineering Lab	P	0	0	2	1	60	40	100
10	105104	Manufacturing Practices	P	0	0	6	3	60	40	100
Total No. of Credits				27						

Semester: 2nd (Chemistry Group)										
Sr	Course Code	Course Name	Type of Subject T/P	(Hours Per Week)			No. of Credits	Internal Marks	External Marks	Total Marks
				L	T	P				
1	100102	Engineering Chemistry	T	4	1	0	5	50	50	100
2	100201	Engineering Mathematics-II	T	4	1	0	5	50	50	100
3	103101	Basic Electrical Engineering	T	4	1	0	5	50	50	100
4	105101	Elements of Mechanical Engineering	T	4	1	0	5	50	50	100
5	105102	Engineering Graphics & Drawing	T/P	1	0	6	4	50	50	100
6	100106	Engineering Chemistry Laboratory	P	0	0	2	1	60	40	100
7	103102	Basic Electrical Engineering Lab	P	0	0	2	1	60	40	100
8	105103	Computer Graphics Lab	P	0	0	2	1	60	40	100
Total No. of Credits				27						

Semester: 3rd										
Sr	Course Code	Course Name	Type of Subject T/P	(Hours Per Week)			No. of Credits	Internal Marks	External Marks	Total Marks
				L	T	P				
1	102301	Computer Organization & Architecture	T	3	1	0	4	50	50	100
2	102302	Operating Systems	T	3	1	0	4	50	50	100
3	102303	Discrete Mathematical Structures	T	3	1	0	4	50	50	100
4	102304	Programming in C++	T	3	1	0	4	50	50	100
5	104401	Digital Electronics	T	3	1	0	4	50	50	100
6	102305	Operating Systems Lab	P	0	0	4	2	60	40	100
7	102306	Programming in C++ Lab	P	0	0	4	2	60	40	100
8	102307	Institutional Training /Internship (6 Weeks)	P	NA	NA	NA	2	60	40	100
9	104407	Digital Electronics Lab	P	0	0	2	1	60	40	100
Total No. of Credits				27						

*Institutional Training will be imparted in the Institute at the end of 2nd Semester for 6-weeks duration. However this Subject is not applicable to LEET Students.

Semester: 4th										
Sr	Course Code	Course Name	Type of Course T/P	(Hours Per Week)			No. of Credits	Internal Marks	External Marks	Total Marks
				L	T	P				
1	100301	Engineering Mathematics-III	T	3	1	0	4	50	50	100
2	102401	Computer Networks	T	3	1	0	4	50	50	100
3	102402	Data Structures	T	3	1	0	4	50	50	100
4	102403	System Software	T	3	1	0	4	50	50	100
5	104505	Microprocessors & its Applications	T	3	1	0	4	50	50	100
6	102404	System Software Lab	P	0	0	4	2	60	40	100
7	102405	Data Structures Lab	P	0	0	4	2	60	40	100
8	104509	Microprocessors & its Applications Lab	P	0	0	2	1	60	40	100
Total No. of Credits				25						

Semester: 5th										
Sr	Course Code	Course Name	Type of Subject T/P	(Hours Per Week)			No. of Credits	Internal Marks	External Marks	Total Marks
				L	T	P				
1	102501	Computer Graphics	T	3	1	0	4	50	50	100
2	102502	Programming using C#.net	T	3	1	0	4	50	50	100
3	102503	Relational Database Management Systems	T	3	1	0	4	50	50	100
4	102504	Software Engineering	T	3	1	0	4	50	50	100
5	102505	Wireless Networks	T	3	1	0	4	50	50	100
6	102506	Computer Graphics Lab	P	0	0	2	1	60	40	100
7	102507	Programming using C#.Net Lab	P	0	0	4	2	60	40	100
8	102508	Relational Database Management Systems Lab	P	0	0	2	1	60	40	100
9	102509	Industrial Training /Internship	P	NA	NA	N A	4	60	40	100
Total No. of Credits				28						

Semester: 6th										
Sr	Course Code	Course Name	Type of Subject T/P	(Hours Per Week)			No. of Credits	Internal Marks	External Marks	Total Marks
				L	T	P				
1	102601	Algorithm Analysis and Design	T	4	1	0	5	50	50	100
2	102602	Human Resource Management	T	4	0	0	4	50	50	100
3	102603	Java Programming	T	4	1	0	5	50	50	100
4		Elective-I	T	4	1	0	5	50	50	100
5		Elective-II	T	4	1	0	5	50	50	100
6	102604	Algorithm Analysis and Design Lab	P	0	0	2	1	60	40	100
7	102605	Java Programming Lab	P	0	0	2	1	60	40	100
Total No. of Credits				26						

Elective-I (Select one of the following subject)	
102606	Open Source Software
102607	Multimedia and Applications
Elective-II (Select one of the following subject)	
102608	Linux Administration System
102609	Programming Mobile Devices

Semester: 7th										
Sr	Course Code	Course Name	Type of Course T/P	(Hours Per Week)			No. of Credits	Internal Marks	External Marks	Total Marks
				L	T	P				
1	100302	Environmental Science	T	3	1	0	4	50	50	100
2	102701	Automata Theory	T	3	1	0	4	50	50	100
3	102702	Web Designing and Development	T	3	1	0	4	50	50	100
4	102703	Management Information Systems	T	3	1	0	4	50	50	100
5		Elective-III	T	3	1	0	4	50	50	100
6	102704	Management Information Systems Lab	P	0	0	4	2	60	40	100
7	102705	Web Designing and Development Lab	P	0	0	4	2	60	40	100
8	102706	Major Project	P	0	0	8	4	60	40	100
Total No. of Credits				28						

Elective-III (Select one of the following subject)	
102707	Artificial Intelligence
102708	Parallel Computing

Semester: 8th										
Sr	Course Code	Course Name	Type of Course T/P	(Hours Per Week)			No. of Credits	Internal Marks	External Marks	Total Marks
				L	T	P				
1	102801	Industrial Training /Internship 6-Months	T/P	N A	NA	N A	20	500	500	1000
Total No. of Credits				20						

Note: The study scheme of semester 1 & semester 2 is not applicable to B.Tech CSE LEET

Annexure-3

Course Name: Communicative English
Course Code: 100101
Semester: 1st

L T P
Credits: 03 **3 0 0**

Course Contents

UNIT - I

Developing Habits of Independent and Fast Reading

Students will be required to read a prescribed prose. The essays in the anthology will be read by students at home with the help of glossary given in the book. Progressing from one lesson to another, they should learn to read fast. Students are supposed to keep a record of their reading in the form of notes, difficulties, summaries, outlines and reading time for each essay. Class teacher may use this record for awards of internal assessment (if any)

UNIT - II

Developing Comprehension Skills

Teacher will provide guided comprehension of the prescribed texts in the class and help students in answering the questions given at the end of each lesson. Teacher can construct more questions of factual and inferential nature to enhance the comprehension skills of the students. The teacher shall also guide students to do the grammar exercise given at the end of each lesson.

Developing skills in Personal Writing

Students will be required to learn short personal write-ups involving skills of description and narration. The types of composition task may include personal letter writing, telegram writing. Notice writing, diary writing etc. The teacher shall instruct the students about the appropriate format and usual conventions followed in such writings. The teacher may also prescribe composition /writing book if so required.

UNIT - III

Business writing

Business letters; elements of business writing; kinds of business letters – office order memorandum, report, purchase order, quotations and tenders, job application letters, personal resume and curriculum vitae etc.

UNIT – IV

Development of Speaking Skills: Public speaking – formal speaking-audience analysis – effective use of voice and body language – importance of confidence building – group discussion – presentation skills-seminar – interview skills development – telephone etiquettes – opinion based speaking.

References Books:

1. Vandana, R. S. (2006).*The Written Word*. Oxford University Press, New Delhi.

2. Samantaray, S. (2017). *Business Communication and Communicative English*. Sultan Chand, New Delhi.

3. Dhanavel, S.P. (2009). *English and Communication Skills for Students of Science and Engineering (with Audio CD).* Orient Blackswan Pvt Ltd.

4. Gimson, A.C. (1971). *An Introduction to the Pronunciation of English*. ELBS

5. Bansal, R.K. & Harrison. (1991). *J.B. Spoken English*.Orient Longman, Hyderabad.

6. Sinclair J. E. (1990). *Collins Cobuild English Grammar Collins*. London : Collins.

7. Leena. Sen (2007). *Communication Skills*.Prentice Hall.

Course Name: Engineering Mathematics – I

Course Code: 100103

Semester: 1st

	L T P
Credits: 05	**4 1 0**

Course Contents

UNIT - I

Ordinary Differential Equations of first order

Exact Differential equations, Equations reducible to exact form by integrating factors; Equations of the first order and higher degree.

UNIT – II

Linear Ordinary Differential Equations of second and higher order

Solution of linear Ordinary Differential Equations of second and higher order; methods of finding complementary functions and particular integrals. Special methods for finding particular integrals: Method of variation of parameters. Cauchy's homogeneous and Legendre's linear equation.

UNIT - III

Partial Derivatives

Function of two or more variables; Partial differentiation; Homogeneous functions and Euler's theorem; Composite functions; Jacobians. Curvature of Cartesian curves; Curvature of parametric and polar curves.

Applications of partial differentiation:

Equation of tangent and normal to a surface; Taylor's and Maclaurin's series for a function of two variables; Errors and approximations; Maxima and minima of function of several variables.

UNIT - IV

Infinite Series

Comparison test, Integral test, Ratio test, Rabee's test, Logarithmic test, Cauchy's root test. Convergence and absolute convergence of alternating series.

References Books:

1. Thomes, G.B. (1995). *Calculus and Analytic Geometry*. Addison Wesley.

2. Kreyszig. (1991). *Advanced Engineering Mathematics*. John Wiley.

3. Grewal, B.S. (2002).*Higher Engineering Mathematics*. Khanna Publishers New Delhi.

4. Babu, R. (2009).*Advance Engineering Mathematics*. Pearson Education.

Course Name: Engineering Physics

Course Code: 100104

Semester: 1st

L T P

Credits: 04 **3 1 0**

Course Contents

UNIT – I

Electrostatics and dielectrics

Divergence and curl of a vector and their physical meaning, electric flux, Relation between electric field and potential, Charge distribution, Gauss law, Dielectric polarization, Types of polarization, Introduction to Maxwell equations and their importance, Equation of EM waves in free space, Velocity of EM waves.

Magnetic Materials and superconductivity:

Basic ideas of Dia, Para, Ferro and ferri magnetic materials, Magnetic anisotropy, Magnetostriction, Introduction to superconductors, Critical temp, Critical field, Type1 and type2 superconductors, Meissner effect, B.C.S theory of superconductivity, Londons equations.

UNIT - II

Laser

Spontaneous and stimulated emission, Einstien coefficient, Population inversion, pumping, Components of laser, Three level and Four level laser, Ruby laser, He-Ne laser, Semiconductor laser, Holography.

Optical Fibre communication:

Introduction, Optical communication (block diagram), Optical fiber physical structure, Basic theory of propagation of light, Modes of propagation, Acceptance angle, Numerical aperture, Normalized frequency, Losses in optical fibre, (scattering losses, Macro bending and Micro bending losses, material and pulse dispersion), Fiber connectors, Splices, Couplers, Applications of optical fibre.

UNIT - III

Theory of relativity

Concept of ether, Michelson Morley experiment, Einstiens postulates of theory of relativity, Gallilian transformation, Lorentz transformation equations, Length contraction, Time dilation, Simultaneity in relativity, Variation of mass with velocity, Mass energy and Energy momentum relation.

Modern physics

Need of quantum theory, Wave particle duality, De Broglie concept, Wave and gp velocity, Heisenberg uncertainty principle and its applications (particle in a box), normalization wave function, Orthogonal wave function, Schrodinger wave equation, applications of S.W.E Particle in a box, eigen value, eigen function.

UNIT - IV

Elements of crystallography

Unit cell, Basis, Space lattice, Crystal system, Introduction, Production of x rays, Hard and soft x rays, Continuous and characteristic x rays, Braggs law in crystals, Absorption of x rays.

Nanophysics

Nanoscale, Surface to volume ratio, Electron confinement, Nanoparticles, nanomaterials, Unusual properties of nano-materials, Synthesis of nanomaterials, Ball milling and sol-gel techniques, Carbon nano tubes, Applications of nanomaterials.

References Books:

1. Griffths, D.J. (1999). *Introduction to Electrodynamics*. Prentice Hall.

2. Singh, R.B. (2010) .*Introduction to Modern Physics*. New Age Internationals.

3. Dogra, R. (2011). *Essentials of Physics*. S.K. Kataria and Sons.

4. Kittle, C. (1951). *Solid State Physics*. John Wiley and Sons Inc

Course Name: Fundamentals of Computer Programming and Information Technology

Course Code: 102101

Semester: 1st

L T P

Credits: 03 **3 0 0**

Course Contents

UNIT - I

Introduction to Computers

Define a Computer System, Block diagram of a Computer System and its working, Associated peripherals, Memories, RAM, ROM, Secondary storage devices, Computer Software and Hardware.

Working Knowledge of Computer System

Introduction to the operating system, Its functions and types, Working knowledge of GUI based operating system, Introduction to word processors and its features, Creating, Editing, Printing and saving documents, Spell check, Mail merge, Creating power point presentations, Creating spreadsheets and simple graphs, Evolution of Internet and its applications and services.

Problem Solving and Program Planning

Need for problem solving and planning a program; program design tools – algorithms, flow charts, and pseudo code; illustrative examples.

UNIT – II

Overview of C++ Language

Introduction to C++ language, Structure of a C++ program, Concepts of compiling and linking, IDE and its features; Basic terminology - Character set, Tokens, identifiers, Keywords, Fundamental data types, Literal and symbolic constants, Declaring variables, Initializing variables, Type modifiers, Operators in C++, precedence and associatively of operators, Expressions and their evaluation, Type conversions.

Beginning with C++ program

Input / output using extraction (>>) and insertion (<<) operators, Writing simple C++ programs, Comments in C++**,** Stages of program execution.

Control Structures

Decision making statements: If, Nested if, If – else. Else if ladder, Switch, Loops and iteration: While loop, For loop, Do – while loop, Nesting of loops, Break statement, Continue statement, Go to statement, Use of control structures through illustrative programming examples.

UNIT – III

Functions

Advantages of using functions, Structure of a function, Declaring and defining functions, Return statement, Formal and actual arguments, Const argument, Default arguments, Concept of reference variable, Call by value, Call by reference, Library functions, recursion, Storage classes. Use of functions through illustrative programming examples.

Arrays and Strings

Declaration of arrays, Initialization of array, Accessing elements of array, I/O of arrays, Passing arrays as arguments to a function, Multidimensional arrays. String as array of characters, Initializing string variables, I / O of strings, String manipulation functions (strlen, strcat, strcpy, strcmp), Passing strings to a function. Use of arrays and strings through illustrative programming examples.

Concepts of Object Oriented Programming

Introduction to Classes, Objects, Data abstraction, Data encapsulation, Inheritance and polymorphism.

UNIT - IV

Classes and Objects

Defining classes and declaring objects, Public and private keywords, Constructors and destructors, Defining member functions inside and outside of a class, Accessing members of a class, Friend function. Use of classes and objects through illustrative programming examples.

Basics of File Handling

Opening, reading, and writing of files, Error handling during files operation

References Books:

1. Balaguruswamy, E. (2008). *Object-Oriented Programming with C++*. Tata McGraw Hill.
2. Sinha, P. K. & Sinha, P. (2010). *Computer Fundamentals*. BPB Publications.
3. Lafore, R. (1995). *Object Oriented Programming in C++*. Waite Group.
4. Stroustrup, B. (2011). *The C++ Programming Language.* Addison Wesley.
5. Lippman, F. B. (2012). *C++ Primer*. Addison Wesley.

Course Name: Basic Electronics & Communication Engineering

Course Code: 104101

Semester: 1st

Credit:- 04 **L T P**

3 1 0

COURSE OBJECTIVE:-

This subject gives a basic knowledge of electronic circuits, Transducers, Semiconductor devices with which a building of innovative technology can be created. The students are expected to learn and understand the importance and application of electronic materials. This knowledge gives them a brief outline of the fundamentals that would be the foundation of today and tomorrow.

COURSE CONTENTS

Semiconductors, Diodes and Diode Circuits

Insulators, Semiconductors and metals, Mobility and conductivity, Intrinsic and extrinsic semiconductors and charge densities in semiconductors, Current components in semiconductors, Continuity equation. PN Junction diode- characteristics and analysis, Types of diodes – Zener diodes, Photodiodes, Light emitting diodes (LEDs), Varactor diodes and tunnel diodes. Rectifiers and filter circuits: Half wave, Full wave and Bridge rectifier circuits and their analysis, L, C and Pi filters, Basic regulator supply using zener diode. Working of Switched Mode Power Supply.

Electronic Instruments

Role and importance of general purpose test instruments, Electronic Multimeter, Cathode Ray Oscilloscope, Measurement of amplitude, Frequency and phase using CRO. Introduction and application of Digital Multimeter.

Transistors:

Construction and characteristics of bipolar junction transistors (BJTs)- Comm. Base, Comm. Emitter and communication, Collector configuration, Transistor biasing.

Field Effect Transistor

Construction and characteristics of JFET, Biasing circuit, JFET amplifier, MOSFET construction and characteristics.

Amplifiers and Oscillators

Classification of amplifiers, Concept of feedback, General characteristics of feedback amplifiers, Single stage RC coupled amplifier. Basic principle of Oscillators, Tank & crystal circuit.

Operational Amplifiers

Introduction to Op-amp, Inverting and non-inverting configuration.

Basic Communication System

Fundamentals of Communication system.

Digital Electronics

Binary, Octal and Hexadecimal number system & their arithmetic operation, Logic gates, Introduction of R-S, J-K, D and T Flip Flops and their truth tables.

Transducers

Introduction, working and applications of LVDT, Strain Gauge and Thermistor.

Recommended Books

1. Basic Electrical and Electronics and Computer Engg. by R Muthusubramanian, S. Salivahanan, K.A. Muraleedharan; Tata McGraw Hill
2. A Text Book of Electrical Tech. by B.L. Theraja & A.K. Theraja; S. Chand.
3. A Course in Electrical and Electronics Measurements & Instrumentation by A.K. Sawhney; Dhanpat Rai & Co.
4. Basic Electrical and Electronics Engg. by J.B. Gupta
5. Basic Electronics Engg. and Linear Circuits by N.N. Bhargave
6. Basic Electrical and Electronics Engg. by S.K. Sahdev (Unique International Publication)

Course Name: Fundamentals Of Computer Programming & Information Technology Lab
Code: 102102
Semester: 1st

Credit: - 02 **L T P**
0 0 4

COURSE CONTENTSS:

1. Familiarization with the Computer System:

a) To explain the part of the computer system such as system unit, input devices, output devices connected to the computer.

b) To explore the outside view of the system unit that includes the panels on front and ports at the rear

c) To explore the inside view of the system unit that includes the motherboard, processor, expansion slots, various add-on cards, storage devices, power supply, fans.

d) To understand the booting process that includes switching on the system, execution of POST routine, then bootstrap loader, and loading of the operating system, and getting it ready for use.

e) To introduce the graphical user interface (desktop) of Windows operating system

I. to explain the various elements of the desktop such as taskbar, icons (My Computer, Recycle Bin, etc.), short cuts, notification area.

II. To configure the desktop that includes selecting the wall paper, selecting the screen saver with or without password protection, selecting the screen resolution and color quality.

2. Navigating with Window Explorer:

a) To navigate with the drives

b) To create new folders

c) To move folders from one drive to another drive

d) To move files from one folder to another folder

e) To search files and folders

f) To share files and folders

g) To view and/or change the attributes of the files and folders

3. Working with Control Panel:

a) To work with date and time

b) To create new user accounts

c) To install new hardware and configuring existing hardware

d) To install new software or remove existing installed software

e) To configure network connections

f) To manage security profile

4. Miscellaneous Features:

a) To work at the command prompt

b) To open an application, folder, document or internet resource from the Run command

c) To initialize storage media (formatting)

d) To understand the menace of viruses

e) To understand the working of virus guards and antivirus software

5. Exploring the Internet:

a) To understand the working of the internet that include the use of protocols, domains, IP addresses, URLs, web browsers, web servers, mail-servers, etc.

b) To create email-account, sending mails, receiving mails, sending files as attachments, etc.

c) To login to a remote computer

d) To search information using search engines

6. Microsoft Word:

a) To familiarize with parts of Word window

b) To create and save a document

c) To set page settings, create headers and footers

d) To edit a document and resave it

e) To use copy, cut and paste features

f) To use various formatting features such as bold face, italicize, underline, subscript, superscript, line spacing, etc.

g) To use spelling and grammar checking feature

h) To preview print a document

7. Microsoft Word continued:

a) To create a table with specified rows and columns

b) To enter data in a table

c) To select a table, a row, a column or a cell

d) To insert new row and/or a column

e) To delete a row and/or a column

f) To split and merge a row, column or a cell

g) To understand the mail-merge and to use mail merge feature of MS-Word

8. Microsoft Excel:

a) To familiarize with parts of Excel window

b) To create and save a workbook with single and/or multiple worksheets

c) To edit and format text as well as numbers

d) To apply operations on range of cells using built-in formula

e) To preview and print a worksheet

9. Microsoft Excel continued:

a) To insert new row and/or column in a worksheet

b) To delete a row and/or column in a worksheet

c) To create a variety of charts

d) To import and export data to or from worksheet

10. Microsoft PowerPoint:

a) To familiarize with parts of PowerPoint window

b) To create and save a new presentation

c) To apply design templates to a presentation

d) To insert, edit and delete a slide

e) To use different views of slides

f) To use slide show from beginning or from the current slide

g) To preview and print a presentation

11. Microsoft PowerPoint continued:

a) To check spellings in a presentation

b) To add clip art and pictures in a slide

c) To add chart, diagram and table in a slide

d) To set animation for a selected slide and/or for entire presentation

e) To create slide master and title master

f) To create a custom show

1. Write a program to find the nature of the roots as well as value of the roots. However, in case of imaginary roots, find the real part and imaginary part separately.

2. Write a program, which takes two integer operands and one operator form user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use switch statement).For example, the input should be in the form: 5 + 3 the output should come Result = 8

3. Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a program to generate the first n terms of the sequence. For example, for n = 8, the output should be 0 1 1 2 3 5 8 13

4. Write a program to print all the prime numbers between m and n, where the value of m and n is supplied by the user.

5. The number such as 1991, is a palindrome because it is same number when read forward or backward. Write a program to check whether the given number is palindrome or not.

6. A positive integer number IJK is said to be well-ordered if I<J<K. For example, number 138 is called well-ordered because the digits in the number (1, 3, 8) increase from left to right, i.e., 1 < 3 < 8. Number 365 is not well-ordered because 6 is larger than 5. Write a program that will find and display all possible three digit well-ordered numbers. The program should also display the total number of three digit well-ordered numbers found.

7. Write a function to computer the highest common factor of integer numbers m and n. Use this function to find the highest common factor of integer numbers a and b.

8. Given the marks (out of 100) obtained by each student in a test of a class with n students. Write a program to obtain the following information:

a) minimum and maximum marks scored

b) average score of the class

c) number of students whose score is greater than class's average score

20. Write a program to multiply matrix Am×n by Bp×q, given that n = p.

21. Write a program to sort a list of n integer numbers in ascending order using bubble sort method.

22. Create a class named Student with the appropriate data members and member functions to generate output comprising student's admission no., name, marks in five subjects and the %age of marks obtained. Write a program to use the Student class.

23. Create a class named Complex Number with the appropriate data members and constructors. Include member functions (defined inside the class) to perform the following operations:

a) Inputting a complex number

b) Outputting a complex number

c) Arithmetic operations on two complex numbers

Write an appropriate program to demonstrate use of the Complex Number class.

24. Create a class named Height with feet and inches as its data members. Also include appropriate constructors (and destructor, if required). Include member functions (defined outside the class) to perform the following operations:

a) Inputting a height of a person

b) Displaying a height of a person

c) To get height in inches

d) To compare two heights

Write an appropriate program to demonstrate use of the Height class.

Note: Students are required to prepare a file containing lab exercises based on programming only, where as the oral examination will from the entire syllabus.

Course Name: Engineering Physics Laboratory
Course Code: 100107
Semester: 1st

Credit: -01

L T P
0 0 2

COURSE CONTENTS

1. To study the magnetic field of a circular coil carrying current.
2. To find out polarizability of a dielectric substance.
3. To study the laser beam characteristics like, wave length using diffraction grating aperture & divergence.
4. To study laser interference using Michelsons Interferometer.
5. Study of diffraction using laser beam and thus to determine the grating element.
6. To determine numerical aperture of an optical fibre.
7. To determine attenuation & propagation losses in optical fibres.
8. To find out the frequency of AC mains using electric-vibrator.
9. To find the refractive index of a material using spectrometer.
10. To find the refractive index of a liquid.
11. To study B-H curve using CRO.
12. To find the velocity of ultrasound in liquid.
13. To determine the grain size of a material using optical microscope.

Note: Each student is required to perform at least ten experiments

Suggested Readings / Books

1. Practical Physics, C.L. Arora; S. Chand & Co.
2. Practical Physics, R.S. Sirohi; Wiley Eastern.

Course Name: Communicative English Laboratory
Course Code: 100105
Semester: 1st

Credit :- 01

L T P
0 0 2

COURSE CONTENTS

Lab Exercises

Listening and Speaking

The audio CD accompanying S.P. Dhanavel's book shall be played in the lab to get the students familiar with the standard spoken English. The students must develop a high degree of understanding of spoken material as used in academic and professional environment. The teacher shall help them in the following:

a) With the accent of the speaker if it is unfamiliar to them.

b) The Standard English sounds and pronunciation of words.

c) With the topical vocabulary and the idiomatic expressions which are generally part of colloquial speech.

d) With the implied relationships in larger texts, if they are not stated explicitly.

In addition to the above, extended listening sessions shall be arranged to promote speaking activities among students. For this purpose, a set of twin books (K. Sadanand and S. Punitha Spoken English Part I and II, A Foundation Course (with audio CD), Orient Blackswan), is prescribed for use. The teachers shall play the CDs selectively in the lab and involve the students in the practice work based on them. While taking up lessons, the teacher must promote the use of dictionaries for correct pronunciation and give example practice on word stress and weak forms.

The students are also supposed to supplement their listening practice by regularly viewing news/knowledge channels on the TV or lecture videos on the internet.

At the end of a session, a good speaker must:

a) Be able to produce long turns without much hesitation in an accent that is understood all around.

b) Have ready access to a large lexis and conventional expressions to speak fluently on a variety of topics.

c) Have a knack for structured conversation or talk to make his transitions clear and natural to his listeners.

The teacher may use following different classroom techniques to give practice and monitor the progress of the students:

(a) role play

(b) question-answer

(c) discussion

(d) presentation of papers

(e) seminars

Course Name: Basic Electronics and Communication Engineering Lab

Course Code: 104102

Semester: 1st

L T P

Credits: 01 **0 0 2**

Course Contents

1. Familiarization of electronics component and equipments like C.R.O Function Generator and power supplies etc.

2. To study the V-I characteristics of PN-Junction diode and determine static resistance and dynamic resistance.

3. To study the characteristics of zener diode and hence determine the dynamic resistance form the characteristics

4. Determine the voltage regulation of zener diode stabilizer.

5. To study and plot the wave form of half wave and full wave rectifier with and without capacitor filter.

6. To study and plot the input and output characteristics of common emitter transistor and calculate its input and output resistance.

7. To study and plot the input and output characteristics of common base transistor and calculate its input and output resistance.

8. To study the characteristics of FET (Field effect transistor) and hence calculate dynamic (rd), mutual conductance (gm) and amplification factor.

9. To study the frequency response of single stage CE amplifier and hence calculate the band width (1dbBW).

10. To study the transistor response.

11. To analysis the truth tables of various basic digital gates.

Course Name: Manufacturing Practices

Course Code: 105104

Semester: 1st

L T P

Credits: 03 **0 0 6**

Course Contents

UNIT - I

Carpentry and Pattern Making

Various types of timber and practice boards, Defects in timber, Seasoning of wood; tools, Wood operation and various joints; Exercises involving use of important carpentry tools to practice various operations and making joints.

Foundry Shop

Introduction to moulding materials; Moulds; Use of cores; Melting furnaces; Tools and equipment used in foundry shops; Firing of a cupola furnace; Exercises involving preparation of small sand moulds and castings.

UNIT – II

Forging Practice

Introduction to forging tools; Equipments and operations; Forge ability of metals; Exercises on simple smithy; Forging exercises.

Machine Shop

Machines, Grinders etc. Cutting tools and operations; Exercises involving awareness.

UNIT - III

Welding Shop

Introduction to different welding methods; Welding equipment; Electrodes; Welding joints; Welding defects; Exercises involving use of gas / electric arc welding.

Electrical and Electronics Shop

Introduction to electrical wiring; Preparation of PCBs involving soldering applied to electrical and electronic applications; Exercises preparation of PCBs involving soldering applied to electrical and electronic applications.

UNIT - IV

Sheet Metal

Shop development of surfaces of various objects; Sheet metal forming and joining operations, Joints, Soldering and brazing; Exercises involving use of sheet metal forming operations for small joints.

Fitting Shop

Introduction of fitting practice and tools used in fitting shop; Exercise involving marking, Cutting, Fitting practice (Right Angles), Male-Female mating parts practice, trapping practice.

References Books: -

1. Raghuwanshi, B.S. (2009*). A Course in Workshop Technology, Vol 1 and II*. Dhanpat Rai and Sons.

2. Jain, R.K. (2010*). Production Technology*. Khanna Publishers.

3. Singh, S. (2001).*Manufacturing Practice*. SK Kataria and Sons.

Course Name: Engineering Chemistry

Course Code: 100102

Semester: 2nd

L T P

Credits: 05 **4 1 0**

Course Contents

UNIT – I

Spectroscopy and its Applications

An introduction UV / Visible Spectroscopy Selection rules Line widths and intensity of spectral lines Principle and instrumentation Electronic Transitions Chromophores and auxochromes Factors affecting λ Max and intensity of spectral lines Franck-Condon principle, Applications.IR Spectroscopy Principle and instrumentation, Vibrational frequency, Fundamental modes of vibrations and types Anharmonics Factors affecting vibrational frequency. Applications.NMR Spectroscopy Principle and instrumentation; Chemical shift Spin-Spin Splitting High resolution NMR spectrum (PMR only).

Photochemistry

Introduction Photo-physical and photochemical processes Light sources in photochemistry Beer-Lambert Law, Laws of Photochemistry, Quantum yield (primary and overall) Primary and secondary photochemical reactions, Jablonski diagram, Photovoltaic cells.

UNIT – II

Water and its Treatment

Boiler feed water Boiler feed problems Specification, Scales and sludge formation Priming and foaming Caustic embrittlement, Boiler corrosion Different methods of the water purifications and softening Desalination of water Water for domestic use Specification; Disinfection of water.

Green Chemistry and its Applications

Introductory overview – Definition and concepts of Green chemistry Emergence of Green chemistry Twelve principles of Green Chemistry with emphasis on the use of alternative feedstock (bio-fuels) Use of innocuous reagents in natural processes Alternative solvents Design of safer chemicals Designing

alternative reaction methodology, Minimizing energy consumption.

UNIT - III

Corrosion and its Prevention

Introduction Different types of corrosion – Wet, Dry corrosion and other forms of corrosion. Mechanisms of wet corrosion various methods of corrosion control.

Catalysis and Polymers

Introduction Catalysis and general characteristics of catalytic reactions; Homogenous catalysis Enzyme catalysis including their mechanism Classification of polymers; Mechanism of addition and condensation polymerization Phenol formaldehyde resin Urea formaldehyde resin.

UNIT - IV

Nanochemistry

Introduction Materials self-assembly Molecular vs. materials self-assembly Self- assembling materials Two dimensional assemblies Mesoscale self assembly Nanoscale materials Future perspectives, Nanocrystals.

Petrochemicals

Introduction First, second and third generation petrochemicals Primary Raw Materials for Petrochemicals.
Natural gas: Natural gas treatment processes Natural gas liquids Properties of natural gas.
Crude oil: Composition of crude oil Hydrocarbon compounds, Non-hydrocarbon compounds, Production of ethylene and propylene. Metallic crystals, Crude oil classification, Physical separation processes and Conversion processes.

References Books:

1. Kemp, W. (1991). *Organic Spectroscopy*. Palgrave Foundations.

2. Skoog, D. A., Holler, F. J., & Timothy, A. N. (1998). *Principles of Instrumental Analysis (*5th Edition). Saunders College Publishing. Philadelphia.

3. Castellan G. W. (1995). *Physical Chemistry*. Saunders College Publishing. Philadelphia.

4. Poole C. P., & Owens, F. J. (2003). *Introduction to Nanotechnology*. Wiley Interscience.

5. Foster L.E. (2007). *Nanotechnology, Science Innovation and Opportunity*. Pearson Education.

Course Name: Engineering Mathematics – II

Course Code: 100201

Semester: 2nd

	L	T	P
Credits: 05	**4**	**1**	**0**

Course Contents

UNIT - I

Matrices

Linear dependence of vectors and rank of matrices. Elementary transformation, Gauss- Jordan method to find inverse of a matrix, Consistency and solution of algebraic equations, Linear transformations, Eigen values, Eigen Vectors, Cayley Hamilton Theorem,

UNIT - II

Integral Calculus

Rectification of standard curves; Areas bounded by standard curves; Volumes and surfaces of revolution of curves. Double and triple integration, Change of order of integration, Change of variable. Application of double integration to find areas. Application of double and triple integration to find volumes, Beta and gamma functions.

UNIT – III

Application of Vector Calculus

Flux, Solenoid and irrotational vectors. Gauss Divergence theorem. Green's theorem in plane. Stoke's theorem.

Statistics

Discrete and continuous probability distributions. Binomial, Poisson and Normal distribution.

UNIT - IV

Complex Numbers:

De-Moivre's theorem and applications, Exponential and logarithmic complex functions, Circular and hyperbolic functions of complex variables, Summation of trigonometric series.

References Books:

1. Thomes, G.B. & Finney, R.L. (1995). *Calculus and Analytic Gemetry*. Ninth Edition; Addition Wesley

2. Kreyszig, E. (1998). *Advanced Engineering Mathematics*. Eighth Edition; John wiley.

3. Grewal, B.S. (1965). *Higher Engineering Mathematics*. Khanna Publishers, New Delhi.

4. Ram, B. (2009). *Advance engineering Mathematics*. Pearson Education.

Course Name: Basic Electrical Engineering

Course Code: 103101

Semester: 2nd

	L	T	P
Credits: 05	**4**	**1**	**0**

Course Contents

UNIT - I

DC Network Theorems

Circuit elements and related terminology, Illustration and Limitations of ohm's Law , Kirchhoff's Laws statements and Illustration, Method of solving circuits by Kirchhoff's Laws, Star-Delta conversions, Computation of resistance in constant temperature, Resistance at different temperatures, Units, Work, Power and Energy (Electrical, Thermal and Mechanical) DC transients –for R-L and R-C series circuits.

Theorems

Thevenin's theorem, Superposition theorem, Norton Theorem, Maximum Power transfer theorem, Reciprocity theorem,

UNIT - II

AC Fundamental

Production of alternating voltage, Waveforms, Average and RMS values, Peak factor, form factor, Phase and phase difference, Phasor representation of alternating quantities, Phasor diagram, Behavior of AC series, Parallel and series parallel circuits, Power factor, Power in AC circuit, Effect of frequency variation in RLC series and parallel circuit, Q factor, Band width of resonant circuit.

Electromagnetism

Magnetic circuits, Analogous quantities in magnetic and electric circuits, Faradays' law, self and mutual inductance, Energy stored in magnetic field, Hysteresis and Eddy current losses, and Electromechanical Energy conversion

UNIT - III

DC Machines

Construction, Types of armatures winding (Lap and wave)

DC generator: Principle of operation, EMF equation, Applications.

DC motors: Principle of operation, Speed-torque Characteristics (shunt and series machine).

UNIT - IV

Single Phase Transformer

Principle of Operation, Construction, EMF equation, Losses of a transformer, Open and short circuit tests and efficiency.

Three Phase Induction Motor

Types, Construction, Production of rotating field, Principle of operation, Applications.

References Books:

1. Muthusbramanian, R. S., Salivahanan, K.A., & Muraleedharan. (1899). *Basic Electrical and Electronics and Computer Engg.* Tata Mcgraw-Hill.

2. Theraja, B.L. & A.K. Theraja.(1959). *A Text Book of Electrical Tech*. Twenty Third Edition; S. Chand.

3. Deltoro, Vincent. (1989). *Fundamentals of Electrical Engg*. Prentice Hall.

4. Sawhney, A.K. (2012). *A Course in Electrical and Electronics Measurements and Instrumentation*. Dhanpat Rai and Co.

Course Name: Elements of Mechanical Engineering

Course Code: 105101

Semester: 2nd

L T P

Credits: 05 **4 1 0**

Course Contents

UNIT - I

Fundamentals of Thermodynamics

Definition, Concept of thermodynamic system, boundary and surroundings, Type of System Open, Closed and isolated systems, State, Property, Process and cycle, Reversible, Quasi-static and irreversible processes and conditions for reversibility, Energy and its forms energy transfer across system boundaries, Heat and work, property and energy as point and path functions, Ideal gas and characteristic gas equation, Zeroth law of thermodynamics, Concept of thermal equilibrium and principle of thermometry.

First Law of Thermodynamics and Its Applications

Essence and corollaries of the first law, Analytical expressions applicable to a process and cycle internal energy, Enthalpy and specific heats first law analysis of steady flow, applications of steady flow energy equation to various engineering devices, Closed and open systems, Analysis of non-flow (Close System) and flow (Open System) processes for an ideal gas under constant volume (Isochoric), Constant pressure (Iso baric), Constant temperature (Isothermal), Adiabatic and polytropic conditions, Analysis of free expansion and throttling processes.

UNIT - II

Second Law of Thermodynamics

Limitations of first law, Need of second law of thermodynamics, Various statements of second law and their equivalence, Applications of statements of second law to heat engine, Heat pump and refrigerator, Philosophy of Carnot cycle and its consequences, Carnot theorem for Heat engines and heat pump, Claussius inequality, Concept and; philosophy of entropy and entropy changes during various processes, Temperature entropy chart and representation of various processes on it.

Gas Power Cycles

Concept and philosophy of Air Standard Cycle and Air standard Efficiency, Some basic definitions of Piston-Cylinder arrangement, Working of Otto cycle, Diesel cycle, Dual cycle and Brayton cycle their representation on P-V and T-S Charts, Comparison of Otto cycle, Diesel cycle, Dual cycles, Mean Effective Pressure, Introduction to constructional features and working of two stroke and four stroke petrol and diesel engines and their comparison.

UNIT - III

Classification of Engineering Materials

Introduction Materials and Engineering, Classification of Engineering Materials, Significance of various Mechanical Properties of Materials e.g., Elasticity, Plasticity, strength, Ductility, Brittleness, Malleability, Toughness, Resilience hardness, Mach inability, Formability, Weld ability, Properties, Composition, and Industrial Applications of materials metals (ferrous- cast iron, tool steels, stainless steels and non ferrous-Aluminum, brass, bronze), Polymers (natural and synthetic, thermoplastic and thermosetting), Ceramics (glass, optical fibre glass, cements), Composites (fibre reinforced, metal matrix), Smart materials (piezoelectric, shape memory, Thermo chromic, Photo chromic, Magneto rheological), Conductors, Semi-conductors and Insulators, Organic and Inorganic materials, Selection of materials for engineering applications.

UNIT - IV

Mechanics of Solids

Concept of stress strain curve, Yield point, Elastic limit, Ductility, Elongation, True stress and true strain, Strain energy and resilience, Tension, Compression, Torsion, Bending, Hardness, Fatigue, Creep, Impact, Concept and philosophy of stress and strain, Normal, Shear and Temperature stresses longitudinal and lateral strain, Poisson’s ration, Sudden and impact load, Stresses in composite bar due to application of load and temperature, Elastic constants and their significance , Relations between Elastic constants (Without Proof); Young modulus of Elasticity, Poisson’s ratio, Modulus of rigidity, and Bulk modulus, Moment of inertia and centre of gravity of section I,T and C.

References Books:

1. Nag, P.K. (2005). *Engineering Thermodynamics*. Tata McGraw Hill.

2. Yadav, R. (2002). *Thermodynamics and Heat Engines*. Central Publishing House.

3. Rogers, G. & Mayhew, Y.(2002).*Engineering Thermodynamics*. Pearson Education.

4. Rao, Y.V.C.(2003) .*An Introduction to Thermodynamics*. New Age International (P) Limited.

5. Cengel, Y.A. & Boles, M.A.(2011) .*Thermodynamics – An Engineering Approach*. Tata McGraw Hill.

6. Singh, S. (2016). *Strength of materials*. Khanna Publishers.

Course Name: Engineering Graphics and Drawing

Course Code: 105102

Semester: 2nd

	L	T	P
Credits: 04	**1**	**0**	**6**

Course Contentss

UNIT – I

Basic Concepts of Drawing and Projections

Various types of lines, Principles of dimensioning, Size and location dimensions, Symbols, Conventions, Scales (plane and diagonal) and lettering as per IS code of practice (SP-46) for general Engg. Drawing. Exercises on lettering techniques free hand; Printing of letters and numerals in 3,5,8 and 12mm sizes, Vertical and inclined at 75o Instrumental lettering in single stroke. Relevance of projection, Type of projections, Perspective, Orthographic, Axonometric and their basic principles, System of orthographic projection: in reference to quadrants and octants, Illustration through simple problems of projection.

UNIT – II

Projection of Points

Different methods of angle of projections; Projection of points on Plane and projection of point on Auxiliary planes.

Projection of Lines

Projection of lines, True lengths of lines and their horizontal and vertical traces. Rotation method and auxiliary plane method and traces of line.

Projection of Planes

Difference between plane and lamina. Projection of lamina Parallel to one and perpendicular to other, Perpendicular to one and inclined to other, Inclined to both reference planes and Lamina oblique to three reference planes. Application of auxiliary planes, and trace of planes.

UNIT – III

Projection of Solids

Definition of solids, Types of solids: Right and oblique solids; solids of revolution and polyhedrons etc. and their auxiliary views. Visible and invisible details in the projection. Use rotation and auxiliary plane method to draw the projections.

Section of Solids

Definition of Sectioning and its purpose. Principle and Procedure of Sectioning, Types of sectional planes. Illustration through their practice on projection of solids, sectioning by auxiliary planes.

Intersection of Surfaces/Solids

Purpose of intersection of surfaces, Intersection between the two cylinder, Two prisms, Prism and pyramid, Pyramid and pyramid, Cylinder and prism, Cone and cylinder, Sphere and cylinder etc., Use of cutting plane and line method.

Development of Surface

Concept of development, Parallel line, Radial line and triangulation method. Development of prism, Cylinder, Cone and pyramid surface for both right angled and oblique solids and development of unique surfaces like hopper, Tray, sphere etc.

UNIT – IV

Isometric Projection

Classification of pictorial views, Basic Principle of Isometric projection, Difference between isometric projection and isometric drawing. Isometric projection of solids.

Orthographic Projection

Concept of Orthographic Projection, Drawing missing lines and missing view in orthographic projections. Interpretation of production drawings.

References Books:

1. Gill, P.S. (2001). *Engineering Drawing*. S.K; Kataria and Sons, Ludhiana.

2. Bhatt, N.D. (2012). *Engineering Drawing*. Charotar Book Stall, Tulsi Sadan, Anand.

3. French, T.E. & Vierck, C.J.(1993). *Graphic Science*. McGraw-Hill, New York.

4. Zozzora, F. (1958).*Engineering Drawing*. McGraw Hill, New York.

Course Name: Engineering Chemistry Laboratory
Course Code: 100106
Semester: 2nd

	L T P
Credits: 01	**0 0 2**

Course Contents

1. Analysis of Effluents

a) Determination of water by EDTA method.

b) Determination of H2O by dissolved oxygen analyzer.

c) Determination of turbidity by Nephelometer

d) Determination of Residual Chlorine.

2. Analysis of Fuels and Lubricants

a) Determination of Moisture, Volatile and ash content by proximate analysis.

b) Determination of Flash and Fire point by Abee's Apparatus

c) Determination of the viscosity.

d) Determination of Acid Value and Aniline point of oil

e) Determination of refractive index for oils.

3. Instrumental Analysis

a) Determination λ-max by spectrophotometer and determination of unknown conc of binary mixture of two liquids.

b) Determination of the surface tension by stalagmometer.

c) Determination of the concentration of a solution conductometerically.

d) Determination of the strength of a solution pH meterically.

e) Distinction between acid, ester, ketone using IR spectrophotometer.

f) Determination of bathochromic shifts, hypsochromic and hyperchromic, hypochromic shift of benzene and its derivatives

4. Chromatography

a) Determination of Rf value of amino acid by TLC and identification of the amino acid present.

b) Separation of metallic ions by paper chromatography. Separation of Ions by using complexing agents

c) Separation of plant pigments, Chlorophyll and carotenoids by column chromatography.

d) Determination of the ion exchange capacity of the given ion exchanger.

e) Separation of ions by ion-exchange method.

5. Synthesis and Green Chemistry experiments

a) Preparation of a polymer phenol/urea formaldehyde resin or hexamethylenediamine adipic acid polymer and determination of carbonyl value or acid value.

b) Preparation of aspirin.

c) Preparation of ethyl-2-cyano-3-(4‟-methoxyphenyl)-propeonate (Microwave assisted reaction)

d) Base catalyzed aldol condensation by Green Methodology

e) Acetylation of primary amines using eco friendly method.

Note: Each student is required to perform two experiments from each of the 5 titles (presented bold) depending on his/her Branch and Aptitude.

References Books:

1. Vogel, A.I.. (1980). *Quantitative Inorganic Analysis*. Oxford ELBS.

2. Vogel, A.I.. (1987). *Quantitative Organic Analysis*. Oxford ELBS.

Course Name: Basic Electrical Engineering Lab
Course Code: 103102
Semester: 2nd

	L	T	P
Credits: 01	**0**	**0**	**2**

Course Contents

List of Experiments:

1. To verify ohm's law.
2. To find voltage and current relationship in R-L series circuit.
3. To study resonance of R-L-C circuits.
4. Open circuit and short circuit test of a single phase transformer.
5. Starting and reversing of speed of a D.C. shunt motor by changing connections.
6. Measurement of power in a three phase circuit by two wattmeter method.
7. No load characteristics of D.C. shunt Generators.
8. To measure power and power factor in a single – phase AC- circuit.
9. To verify Kirchhoff's Law.
10. To connect 3 identical single phase transformers for three phase power transformations through following connections (a) star-delta (b) star-star (c) delta-star (d) delta-delta and to find phase and line voltage ratio.
11. To start and reverse the direction of I-Q a.c. motor.
12. To verify superposition theorem.
13. To verify Norton's theorem.
14. To verify thevein's theorem.
15. To verify maximum power transformer theorem.

Course Name: Computer Graphics Laboratory

Course Code: 105103

Semester: 1st

	L T P
Credits: 01	**0 0 2**

Course Contents

List of Experiments:

1. Practice related to 2-D computer sketching. Different command used in computer graphics software and their applications.
2. Study and draw 2-D sketching entities like lines, Rectangle, Parallelogram polygon, circle etc., Using three coordinates system like
   (a) Link
   (b) Gasket
   (c) Base Plate
   (d) Brackets etc.
3. Draw the different type of 3D modeling entries using viewing commands to view them (Isometric projection). Practice of various commands available for 3D drawing like extrude, revolve etc.

Course Name: Computer Organization and Architecture

Course Code: 102301

Semester: 3rd

Credit-4 **L T P**

3 1 0

Course Contents

Unit-I

Functional blocks of a computer: CPU, memory, input-output subsystems, control unit. Instruction set architecture of a CPU – registers, instruction execution cycle, RT Interpretation of instructions, addressing modes, instruction set. Case study – instruction sets of some common.

Data representation: signed number representation, fixed and floating point representations, character representation. Computer arithmetic – integer addition and subtraction, ripple carry Adder, carry look-ahead adder, etc. Multiplication – shift-and add, Booth multiplier, carry save multiplier, etc. Division restoring and non-restoring techniques, floating point arithmetic.

Unit-II

Introduction to x86 architecture.

CPU control unit design: hardwired and micro-programmed design approaches, Case study – design of a simple hypothetical CPU.

Memory system design: semiconductor memory technologies, memory organization.

Peripheral devices and their characteristics: Input-output subsystems, I/O device interface, I/O transfers-program controlled, interrupt driven and DMA, privileged and non-privileged instructions, software interrupts and exceptions. Programs and processes–role of interrupts in process state transitions, I/O device interfaces – SCII, USB

Unit-III

Pipelining: Basic concepts of pipelining, through put and speedup, pipeline hazards.

Parallel Processors : Introduction to parallel-processors, Concurrent access to memory and cache coherency.

Unit-IV

Memory organization: Memory interleaving, concept of hierarchical memory organization, cache memory, cache size vs. Block size, mapping functions, replacement algorithms, write policies.

Suggested reference books:

1. John P. Hayes. (1998).*Computer Architecture and Organization.* 3rd Edition, WCB/McGraw- Hill
2. William Stallings. (2016).*Computer Organization and Architecture*, Designing for Performance", 10th Edition by, PearsonEducation.
3. Vincent P.Heuringand Harry F. Jordan (2204).*ComputerSystemDesignandArchitecture*.2ndEdition, Pearson Education

Course Name: Operating System

Course Code: 102302

Semester: 3rd

Credit-4 **L T P**

3 1 0

Course Contents

Unit-I

Introduction: Concept of Operating Systems, Generations of Operating systems, Types of Operating Systems, OS Services, System Calls, Structure of an OS - Layered, Monolithic, Microkernel Operating Systems, Concept of Virtual Machine. Case study on UNIX and WINDOWS Operating System

Unit-II

Processes: Definition, Process Relationship, Different states of a Process, Process State transitions, Process Control Block (PCB), Context switching

Thread: Definition, Various states, Benefits of threads, Types of threads, Concept of multithreads,

Process Scheduling: Foundation and Scheduling objectives, Types of Schedulers, Scheduling criteria, CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling algorithms: Pre-emptive and Non pre-emptive, FCFS, SJF, RR; Multiprocessor scheduling: Real Time scheduling: RM and EDF.

Unit-III

Inter-process Communication: Critical Section, Race Conditions, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer\ Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problematic.

Unit-IV

Deadlocks: Definition, Necessary and sufficient conditions for Deadlock, Deadlock Prevention, Deadlock Avoidance: Banker's algorithm, Deadlock detection and Recovery.

Unit-V

Memory Management: Basic concept, Logical and Physical address map, Memory allocation: Contiguous Memory allocation– Fixed and variable partition–Internal and External fragmentation and Compaction; Paging: Principle of operation – Page allocation –Hardware support for paging, Protection and sharing, Disadvantages of paging.

Virtual Memory: Basics of Virtual Memory – Hardware and control structures – Locality of reference,Pagefault,WorkingSet,Dirtypage/Dirtybit–Demandpaging,PageReplacement Algorithms, Optimal, First in First Out (FIFO), Second Chance (SC), Not recently used (NRU) and Least Recentlyused(LRU).

Unit-VI

I/O Hardware: I/O devices, Device controllers, Direct memory access Principles of I/O Software: Goals of Interrupt handlers, Device drivers, Device independent I/O software, Secondary-Storage Structure: Disk structure, Disk scheduling algorithms

File Management: Concept of File, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free-space management (bit vector, linked list, grouping), directory implementation (linear list, hash table), efficiency and performance.

Disk Management: Disk structure, Disk scheduling - FCFS, SSTF, SCAN, C-SCAN, Disk reliability, Disk formatting, Boot-block, Bad blocks

Suggested reference books:

1. Charles Crowley. (1996*). Operating System: A Design-oriented Approach*, 1st Edition by, Irwin Publishing
2. Gary J. Nutt, (1999*).Operating Systems: A Modern Perspective*, 2nd Edition by Addison-Wesley
3. Marco Cesati, O'Reilly and Associates (2005*).Understanding the Linux Kernel*, 3rd Edition

Course Name: Discrete Mathematical Structures

Course Code: 102303

Semester: 3rd

Credit-4 **L T P**

3 1 0

Course Contents

Unit-I

Sets, Relation and Function: Operations and Laws of Sets, Cartesian Products, Binary Relation, Partial Ordering Relation, Equivalence Relation, Image of a Set, Sum and Product of Functions, Objective functions, Inverse and Composite Function, Size of a Set, Finite and infinite Sets, Countable and uncountable Sets, Cantor's diagonal argument and The Power Set theorem, Schroeder-Bernstein theorem. Principles of Mathematical Induction: The Well-Ordering Principle, Recursive definition, The Division algorithm: Prime Numbers, The Greatest Common Divisor: Euclidean Algorithm, The Fundamental Theorem of Arithmetic.

Unit-II

Basic counting techniques-inclusion and exclusion, pigeon-hole principle, permutation and combination.

Unit-III

Propositional Logic: Syntax, Semantics, Validity and Satisfiability, Basic Connectives and Truth Tables, Logical Equivalence: The Laws of Logic, Logical Implication, Rules of Inference, The use of Quantifiers. Proof Techniques: Some Terminology, Proof Methods and Strategies, Forward Proof, Proof by Contradiction, Proof by Contraposition, Proof of Necessity and Sufficiency.

Unit-IV

Algebraic Structures and Morphism : Algebraic Structures with one Binary Operation, Semi-Groups, Monoids, Groups, Congruence Relation and Quotient Structures, Free and Cyclic Monoids and Groups, Permutation Groups, Substructures, Normal Subgroups, Algebraic Structures with two Binary Operation, Rings, Integral Domain and Fields. Boolean Algebra

and Boolean Ring, Identities of Boolean Algebra, Duality, Representation of Boolean Function, Disjunctive and Conjunctive NormalForm.

Unit-V

Graphs and Trees: Graphs and their properties, Degree, Connectivity, Path, Cycle, Sub Graph, Isomorphism, Eulerian and Hamiltonian Walks, Graph Colorings, Coloring maps and Planar Graphs, Colorings Vertices, Coloring Edges, List Coloring, Perfect Graph, definition properties and Example, rooted trees, trees and sorting, weighted trees and prefix codes, Bi-connected component and Articulation Points, Shortestdistances.

Suggested reference books:

1. J.P. Tremblay and R. Manohar.(2017).*Discrete Mathematical Structure and It's Application to Computer Science*, TMG Edition,Tatamcgraw-Hill
2. Norman L. Biggs. (2002*). Discrete Mathematics,* 2nd Edition, Oxford University Press. Schaum's Outlines Series, Seymour Lipschutz, MarcLipson,

Course Name: Programming with C++

Course Code: 102304

Semester: 3rd

Credit-4 **L T P**

3 1 0

Course Contents

Unit-I

Object-Oriented Programming Concepts: Introduction, comparison between procedural programming paradigm and object-oriented programming paradigm, basic concepts of object-oriented programming — concepts of an object and a class, interface and implementation of a class, operations on objects, relationship among objects, abstraction, encapsulation, data hiding, inheritance, overloading, polymorphism, messaging.

Unit-II

Standard Input/output: Concept of streams, hierarchy of console stream classes, input/output using overloaded operators >> and << and member functions of i/o stream classes, formatting output, formatting using class functions and flags, formatting using manipulators.

Unit-III

Classes and Objects: Specifying a class, creating class objects, accessing class members, access specifies, and static members, use of const keyword, friends of a class, empty classes, nested classes, local classes, abstract classes, container classes, bit fields and classes.

Unit-IV

Pointers and Dynamic Memory Management: Declaring and initializing pointers, accessing data through pointers, pointer arithmetic, memory allocation (static and dynamic), dynamic memory management using new and delete operators, pointer to an object, this pointer, pointer related problems - dangling/wild pointers, null pointer assignment, memory leak and allocation failures.

Unit-V

Constructors/Destructors and Operator Overloading and Type Conversion: Need for constructors and destructors, copy constructor, dynamic constructors, explicit constructors, destructors, constructors and destructors with static members, initializer lists. Overloading operators, rules for overloading operators, overloading of various operators, type conversion - basic type to class type, class type to basic type, class type to another class type.

Unit-VI

Inheritance and Virtual functions & Polymorphism: Introduction, defining derived classes, forms of inheritance, ambiguity in multiple and multipath inheritance, virtual base class, object slicing, overriding member functions, object composition and delegation, order of execution of constructors and destructors. Concept of binding - early binding and late binding, virtual functions, pure virtual functions, abstract classes, virtual destructors.

Text/References:

1. Lafore R.(1998*). Object Oriented Programming in C++*, WaiteGroup.
2. BjarneStroustrup.(2013*). The C++ Programming Language,* AddisonWesley.
3. Herbert Schildt.(1994).*The Complete Reference to C++ Language*, McGrawHill-Osborne.
4. Lippman F.B(2012). C++ Primer, Addison

Course Name: Digital Electronics

Course Code: 104401

Semester: 3rd

Credit-4 **L T P**

3 1 0

Course Contents

Unit-I

Fundamentals of Digital Systems and logic families

Digital signals, digital circuits, AND, OR, NOT, NAND, NOR and Exclusive-OR operations, Boolean algebra, examples officiates, number systems-binary, signed binary, octal hexadecimal number, binaryarithmetic,one's and two's complements arithmetic, codes, error detecting and correcting codes, characteristics of digital lcs, digital logic families, TTL, Schottky TTL and CMOS logic, interfacing CMOS and TTL, Tri-state logic.

Unit-II

Combinational Digital Circuits

Standard representation for logic functions, K-map representation and simplification of logic functions using K-map, minimization of logical functions. Don't care conditions, Multiplexer, De- Multiplexer/Decoders, Adders, Sub-tractors, BCD arithmetic, carry look ahead adder, serial adder, ALU, elementary ALU design, popular MSI chips, digital comparator, parity checker/generator, code converters, priority encoders, decoders/drivers for display devices, Q-M method of function realization.

Unit-III

Sequential circuits and systems

A 1-bit memory, the circuit properties of Bus table latch, the clocked SR flip flop, J- K-T and D-Types flip flops, applications of flip flops, shift registers, applications of shift registers, serial to parallel converter, parallel to serial converter, ring counter, sequence generator, ripple (Asynchronous) counters, synchronous counters, counters design using flip flops, special counter IC's, asynchronous sequential counters, applications of counters.

Unit-IV

A/D and D/Converters

Digital to analog converters: weighted resistor/converter, R-2R Ladder D/A converter, Specifications for D/A converters, examples of D/A converter lcs, sample and hold circuit, analog to digital converters: quantization and encoding, parallel comparator A/D converter, successive approximation A/D converter, counting A/D converter, dual slope A/D converter, A/D converter using voltage to frequency and voltage to time conversion, specifications of A/D converters, example of A/D converterics.

Unit-V

Semiconductor memories and Programmable logic devices

Memory organization and operation, expanding memory size, classification and characteristics of memories, sequential memory, read only memory (ROM), read and write memory(RAM), content addressable memory (CAM), charge de coupled device memory (CCD), commonly used memory chips, ROM as a PLD, Programmable logic array, Programmable array logic, complex Programmable logic devices (CPLDS), Field Programmable Gate Array(FPGA).

Text/References:

1. R. P. Jain(2009), "Modern Digital Electronics", McGraw HillEducation
2. M. M. Mano(2016), "Digital logic and Computer design", Pearson EducationIndia
3. A. Kumar(2016), "Fundamentals of Digital Circuits", Prentice HallIndia

Course Name: Operating System lab

Course Code: 102305

Semester: 3rd

	L T P
Credits:02	**0 0 4**

Course Contents

1. Installation Process of various operating systems
2. Commands for files & directories: cd, ls, cp, md, rm, mkdir, rmdir. Creating and viewing files using cat. File comparisons. Disk related commands: checking disk free spaces. Processes in Linux, connecting processes with pipes, background processing, managing multiple processes. Manual help. Background process: changing process priority, scheduling of processes at command, batch commands, kill, ps, who, sleep. Printing commands, grep, fgrep, find, sort, Cal, banner, touch, file. File related commands ws, sat, cut,grep.
3. Shell Programming: Basic of shell programming, various types of shell, Shell Programming in bash, conditional & looping statement, case statements, parameter passing and arguments, shell variables, shell keywords, creating shell programs for automate system tasks, report printing.

Course Name: Programming with C++ Lab

Course Code: 102306

Semester: 3rd

	L	T	P
Credits:02	**0**	**0**	**4**

Course Contents

Practical 1 Program to show the of use cin, cout

Practical 2 Program to implement the operators

Practical 3 Program based on decision making statement (ifelse)

Practical 4 Program based on the loops (while, do while)

Practical 5 Program based on loops (for), switch statement

Practical 6 Program based on structures and enumerated data types

Practical 7 Program based functions, overloaded functions

Practical 8 Program to show usage of storage classes.

Practical 9 Program to show usage of function overloading, default arguments

Practical 10 Program to show usage of classes, objects

Practical 11 Program to show usage of constructors, destructors

Practical 12 Program to manipulate arrays and array of objects

Practical 13 Program to manipulate strings.

Practical 14 Program to show usage of inheritance of various type (multiple, multilevel etc.)

Practical 15 Program to show usage of unary operator overloading

Practical 16 Program to show usage of binary operator overloading

Practical 17 Program for conversion from basic to user defined data type

Practical 18 Program for conversion from user defined to basic

Practical 19 Program to show usage of basics of pointers

Practical 20 Program to show usage of pointers and arrays.

Practical 21 Program to show usage of pointers, function arguments

Practical 22 Program to show usage of new, delete, memory management

Practical 23 Program to show usage of virtual function

Practical 24 Program to show usage of friend, static function

Practical 25 Program to show usage of overloaded assignment operator, this pointer

Practical 26 Program to read & write contents of a text file

Practical 27 Program to show usage of file pointers.

Practical 28 Program to show usage of command line arguments

Practical 29 Program to show usage of overloading of right & left shift operators.

Practical 30 Program to show usage of exception handling mechanism

Practical 31 Program to show usage of uncaught exception(), the exception and bad exception Classes

Practical 32 Program to show usage of templates Practical 33 Program to show usage of genericclasses

Practical 34 Implementation of File handling

Practical 35 Implementation of Wrapper classes

Practical 36 Implementation of container classes

Course Name: Digital Electronics Lab

Course Code:104407

Semester: 3rd

	L	T	P
Credits:01	**0**	**0**	**2**

Course Contents

1. A) Verification of the truth tables of TTL gates, e.g., 7400, 7402, 7404, 7408, 7432,7486.
   b) Design, fabrication and testing of low frequency TTL clocks using NAND gates.
2. A) Verification of the truth table of the Multiplexer74150.
   B) Verification of the truth table of the De-Multiplexer 74154.
3. Design and verification of the truth tables of half adder and full adder circuits using gates 7483.
4. Study and verification of the operations of ALU 74181 with regard to addition / subtraction / comparison.
5. Design, fabricate and test a switch debounce using7400.
   a) Design and test of an S-R flip-flop using NOR/NANDgates.
   b) Verify the truth table of a J-K flip-flop(7476)
   c) Verify the truth table of a D flip-flop (7474) and study its operation in the toggle and asynchronousmodes.
6. Operate the counters 7490, 7493 and 74192. Verify the frequency division at each stage. With a low frequency clock (say 1 Hz) display the count onleds.
   a) Verify the truth table of decoder driver 7447 / 7448. Operate a 7 segment LED display through a counter using a low frequencyclock.

Repeat the above with the BCD to Decimal decoder 7442 and an array of leds

Course Name: Engineering Mathematics-III

Course Code: 100301

Semester: 4th

L T P

Credits: 04 **3 1 0**

Course Contents

Unit-I

Basic formulas of differentials: - Derivatives of trigonometric functions and hyperbolic functions

Unit-II

Functions of Complex Variable: - Analytic functions, Cauchy-Riemann equations, Laplace equation, elementary functions, Cauchy's integral theorem (Proof by using Green's theorem), Cauchy's integral formula, Taylor series and Laurent series (without proof).

Unit-III

Residues and applications: - Residues and applications to evaluate real improper integrals and inverse Laplace transforms.

Unit-IV

Solutions by the method of separation of variables wave equation, heat equation, Laplace equations solutions by the method of separation of variables and by Fourier and Laplace transforms.

Unit-V

Ordinary differential Equation Picards method, Runga-kutta method of order- I, Runga-kutta method of order- II, Runga-kutta method of order- III, Runga-kutta method of order- IV, Milne's-predictor correctormethod.

REFERENCE BOOKS

1. Kreyszig, E. (2011).*Advanced Engineering Mathematics*, John Wiley.

2. Ray Wylie, C. (1995). *Advanced Engineering Mathematics,* 6th ed., McGrawHill.

3. Zill D.G., and Cullen, M.R.(1999).*Advanced Engineering Mathematics*, CBSPublishers.

Course Name: Computer Networks

Course Code: 102401

Semester: 4th

L T P

Credits:04 **3 1 0**

Course Contents

Unit-I

Data Communication Components

Representation of data and its flow Networks, Various Connection Topology, Protocols and Standards, OSI model, Transmission Media, LAN: Wired LAN, Wireless LANs, Connecting LAN and Virtual LAN, Techniques for Bandwidth utilization: Multiplexing - Frequency division, Time division and Wave division, Concepts on spread spectrum.

Unit-II

Data Link Layer and Medium Access Sub Layer

Error Detection and Error Correction - Fundamentals, Block coding, Hamming Distance, CRC; Flow Control and Error control protocols - Stop and Wait, Go back – N ARQ, Selective Repeat ARQ, Sliding Window, Piggybacking, Random Access, Multiple access protocols -Pure ALOHA, Slotted ALOHA, CSMA/CDCDMA/CA

Unit-III

Network Layer

Switching, Logical addressing – IPV4, IPV6; Address mapping – ARP, RARP, BOOTP and DHCP–Delivery, Forwarding and Unicast Routing protocols.

Unit-IV

Transport Layer

Process to Process Communication, User Datagram Protocol (UDP), Transmission Control Protocol (TCP), SCTP Congestion Control; Quality of Service, Quos improving techniques: Leaky Bucket and Token Bucket algorithm

Unit-V

Application Layer

Domain Name Space (DNS), DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW,

HTTP, SNMP, Bluetooth, Firewalls, Basic concepts of Cryptography.

.

Reference Books:

1. Behrouz A. Frozen(2007*).Data Communication and Networking*. 4th Edition, McGraw- Hill.
2. William Stallings. (2007), *Data and Computer Communication,* 8th Edition, PearsonPrentice HallIndia.

Course Name: Data Structure& Algorithms

Course Code: 102402

Semester: 4th

Credit-4 **L T P**

3 1 0

Course Contents

Unit-I

Introduction: Basic Terminologies: Elementary Data Organizations, Data Structure Operations: insertion, deletion, traversal etc.; Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off. Searching: Linear Search and Binary Search Techniques and their complexity analysis.

Unit-II

Stacks and Queues: ADT Stack and its operations: Algorithms and their complexity analysis, Applications of Stacks: Expression Conversion and evaluation – corresponding algorithms and complexity analysis. ADT queue, Types of Queue: Simple Queue, Circular Queue, Priority Queue; Operations on each Types of Queues: Algorithms and theiranalysis.

Unit-III

Linked Lists: Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; Linked representation of Stack and Queue, Header nodes, Doubly linked list: operations on it and algorithmic analysis; Circular **Linked Lists:** all operations their algorithms and the complexityanalysis.

Trees: Basic Tree Terminologies, Different types of Trees: Binary Tree, Threaded Binary Tree, Binary Search Tree, AVL Tree; Tree operations on each of the trees and their algorithms with complexity analysis. Applications of binary trees. B Tree, B+ Tree: definitions, algorithms and analysis.

Unit-IV

Sorting and Hashing: Objective and properties of different sorting algorithms: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort; Performance and Comparison among all the methods, Hashing.

Graph: Basic Terminologies and Representations, Graph search and traversal algorithms and complexity analysis.

Reference books:

1. Mark Allen Weiss. (1995), *Algorithms, Data Structures, and Problem Solving with C++",* Illustrated Addison-Wesley PublishingCompany.
2. R. G Drome.(2009).*How to solveit by Computer*, 2nd Impression by, PearsonEducation.

Course Name: System Software

Course Code: 102403

Semester: 4th

Credit-4 **L T P**

3 1 0

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Course Contents

Unit-I

Editors:

1. Line editor, Full screen editor and multi windoweditor.
2. Case study MS-Word, DOS Editor and vieditor.

Unit-II

Assemblers:

1. First pass and second pass of assembler and their algorithms.
2. Assembler Database.
3. Concept of Loader.

Unit-III

1. Various loading schemes

Unit-IV

Compilers:

1. Introduction to various translators.
2. Various phases of compiler.
3. Introduction to Grammars and finite automata.
4. Bootstrapping for compilers.
5. Lexical Analysis and syntax analysis.
6. Intermediate Code Generation.
7. Code optimization techniques.

8. Code generation
9. Case study: LEXX and YACC.

Unit-V

Debuggers:

1. Introduction to various debuggingtechniques.
2. Case Study: - Debugging in Turbo C++IDE.

Unit-VI

Macro Language & Macro Processor:

1. Macroinstruction.
2. Features of a Macro Facility
3. Detailed study & Implementation.

References:

1. Aho A.V. and J.D. Ullman(1985), Principles of compiler Design Addison Wesley/ Narosa .

Course Name: Microprocessors & its Applications

Course Code: 104505

Semester: 4th

Credit-4 **L T P**

` **3 1 0**

Course Contents

Unit-I

Introduction to Microprocessor

History and Evolution, types of microprocessors, 8085 Microprocessor, Architecture, Bus Organization, Registers, ALU, Control section, Instruction set of 8085, Instruction format, Addressing modes, Types of Instructions.

Unit-II

Assembly Language Programming and Timing Diagram

Assembly language programming in 8085, Macros, Labels and Directives, Microprocessor timings, Micro instructions, Instruction cycle, Machine cycles, T states, State transition diagrams, Timing diagram for different machine cycles.

Unit-III

Serial I/O, Interrupts and Comparison of Contemporary Microprocessors

Serial I/O using SID, SOD, Interrupts in 8085, RST instructions, Issues in implementing interrupts, Multiple interrupts and priorities, Daisy chaining, Interrupt handling in 8085, Enabling, disabling and masking of interrupts, Brief comparison of contemporary 8-bit microprocessors like Z-80, M68000 with8085.

Unit-IV

Data Transfer Techniques

Data transfer techniques, Programmed data transfer, Parallel data transfer using 8155. Programmable parallel ports and handshake input/output, Asynchronous and Synchronous data transfer using 8251A. Programmable interrupt controller 8259A. DMA transfer, cycle stealing and burst mode of DMA, 8255, 8257 DMAcontroller.

Unit-V

Microprocessor Interfacing Techniques

Interfacing memory and I/O devices, Addressing memory, interfacing static RAMs, Interfacing and refreshing dynamic RAMs, Interfacing a keyboard, Interfacing LED and seven segment displays, Interfacing a printer, Interfacing A/D converters, D/A converters.

Unit-VI

Architecture of Typical 16 Bit Microprocessors (Intel 8086)

Memory address space and data organization - Segment registers and memory segmentation - Generating a memory address - I/O address space - Addressing modes - Comparison of 8086 and 8088-Basic 8086/8088 configuration - Minimum mode - Maximum mode - System timing.

Unit-VII

Introduction to 80186/188, 286, 386 & 486 with Block diagram, features & application.

Reference Books

1. D.V.HALL(2002),*Microprocessors and Digital Systems,* McGrawHill
2. Berry.B.Bray.(2013),*INTEL 8086/88, 80186, 286, 386, 486, Pentium Pro & Pentium IV*.

Course Name: Microprocessors & its Applications Lab

Course Code: 104509

Semester: 4th

Credit-1 **L T P**

Course Content **0 0 2**

List of Experiments:

1. Study of 8085 Microprocessor Kit.
2. Write a program to add two 8-bit numbers using 8085 & 8086.
3. Write a program to add two 16-bit numbers using 8085 &8086.
4. Write a program to subtract two 8-bit numbers using 8085 &8086.
5. Write a program to subtract two 16-bit numbers using 8085 &8086.
6. Write a program to multiply two 8 bit numbers by repetitive addition method using 8085 & 8086.
7. Write a program to multiply two 8 bit numbers by rotation method using 8085 &8086
8. Write a program to multiply 16-bit number with 8-bit number using 8085 &8086.
9. Write a program to generate Fibonacci series using 8085 & 8086.
10. Write a program to sort series using bubble sort algorithm using 8085 &8086.
11. Study 8086 Microprocessorkit
12. Write a program to copy 12 bytes of data from source to destination using8086.
13. Write a program to find maximum and minimum from series using8086.
14. Write a program to control the operation of stepper motor using 8085 & 8086 microprocessors and 8255 PPI.
15. Write a program for finding square of a number using look-up table andverify.
16. Write a program to control the 8085 & 8086 temperature using microprocessors and 8255 PPI.
17. Write a program to control the traffic light system using 8085 & 8086 microprocessors and 8255PPI.
18. Write a program to control speed of DC motor using 8085 & 8086microprocessors

Course Name: System Software Lab

Course Code: 102404

Semester: 4th

Credit-2 **L T P**

` **0 0 4**

Course Contents

1. Create a menu driven interface for
   a) Displaying contents of a file pagewise
   b) Counting vowels, characters, and lines in a file.
   c) Copying afile
2. Write a program to check balance parenthesis of a given program. Also generate the error report.
3. Write a program to create symbol table for a given assembly language program.
4. Write a program to create symbol table for a given high-level language program.
5. Implementation of single pass assembler on a limited set of instructions.
6. Exploring various features of debug command.
7. Use of LEX and YACCtools

Course Name: Data Structures Lab

Course Code: 102405

Semester: 4th

Credit-2 **L T P**

` **0 0 4**

Course Contents

1. Write a program to insert an element into an array
2. Write a program to delete an element from an array.
3. Write a program to implement linear search algorithm
4. Write a program to implement binary search algorithm
5. Write a program to implement bubble sort algorithm.
6. Write a program to implement selection sort algorithm.
7. Write a program to implement PUSH operation in stacks.
8. Write a program to implement POP operation in stacks.
9. Write a program to implement Queues
10. Write a program to insert an element in the beginning of the linklist.
11. Write a program to insert an element in the middle of the linklist.
12. Write a program to insert an element in the end of the linklist.
13. Write a program to delete an element from the beginning of the linklist.
14. Write a program to delete an element from the end of the linklist.
15. Write a program for implementation of a graph
16. Write a program for implementation of binary search tree

Course Name: Computer Graphics

Course Code: 102501

Semester: 5th

Credit-4 **L T P**

` **3 1 0**

Course Contents

Unit-I

Introduction: What is Computer Graphics, Elements of a Graphics, Applications and Components, working of Interactive Graphics, Display Processors; Graphic Devices: Raster scan and Random Scan displays, Resolution, Aspect Ratio, Refresh CRT, Color CRT monitors, Lookup tables, Plasma Panel and LCD monitors, interlacing, grey shades; Interactive Input **Devices:** keyboard, mouse, trackball, joystick, light pen, digitizing tablet, image scanners, voice system; Hard Copy Devices: printers, plotters.

Unit-II

Basic Raster Graphics: Scan conversion & Drawing Geometry: Coordinate Systems; Output Primitives: symmetrical and simple DDA line drawing algorithm, Bresenham's line drawing, loading frame buffer; symmetrical DDA for drawing circle, Polynomial method for circle drawing; circle drawing using polar coordinates, Bresenham's circle drawing, Filling: Stack-based seed fill algorithm, Scan-line seed fill algorithm.

Unit-III

Geometric Manipulation: 2D Transformations: Translation, Rotation, Scaling, Matrix representations and Homogeneous coordinate Transformations Matrices, Homogeneous Co-ordinates.

2-DViewing: Windowing, Viewport.

Clipping operations: Point and Line clipping, Cohen-Sutherland line clipping, Mid-point Sub Division line clipping, Sutherland-Hodgman polygon clipping.

Unit-IV

Elementary 3-D Graphics: 3-D Graphics, 3-D modeling of objects, 3-D transformation matrices for Translation, Scaling and Rotation, Parallel Projection: Orthographic and Oblique Projection, Perspective projection. Hidden surface removal /Visibility: Image and object precision, Z- buffer algorithms, area based algorithms, floating horizon.

Unit-V

Advanced Issues: Curves and surfaces: Parametric Representation, Bezier and B- Spline curves, Rendering, Raytracing, Antialiasing, fractals, Gourard and Phong shading.

References:

1. D.Rogers and J. Adams(1999) ,*Mathematical Elements for Computer Graphics*, McGraw -Hill InternationalEdition.
2. David F. Rogers(1997),*Procedural Elements for Computer Graphics*, McGraw Hill Book Company.
3. Newman &Sproull(2001), *Principles of Interactive Computer Graphics,* McGraw Hill

Course Name: Programming using C#.net

Course Code: 102502

Semester: 5th

L T P

Credits:04 **3 1 0**

Course Contents

Unit-I

Introducing C#: Evolution of C#, Characteristics of C#, Applications of C#, difference between C# and C+ +, C# andJava.

Overview of C#: C# programs, namespaces, adding comments, main returning a value using aliases, passing String objects to Write Line-method, command line arguments, providing interactive input using mathematical functions, Multiple Main Methods, compile time errors, program structure, program coding style.

Unit-II

Variables and Data Types: Literals, variables, data types, pointers, declaration/initialization of variables, default values, constant variables, scope of variables, boxing and unboxing.

Operators and Expressions: Arithmetic operators, relational operators, logical operators, assignment operators, increment and decrement operators, conditional operator, bitwise operators, special operators, arithmetic expressions, evaluation of expressions, precedence of arithmetic operators, type conversions, operator precedence and associatively, mathematical functions.

Unit-III

Decision Making and Branching: Decision making with if statement, the if-else statement, nesting of if-else statements, the else if ladder, the switch statement, the? : Operator. Decision Making and Looping: the while statement, the do statement, the for statement, the for each statement, Jumps in loops.

Methods in C#: Declaring methods, the main method, invoking methods, nesting of methods, method parameters, pass by value, pass by reference, the output parameters, variable argument

lists, methods overloading.

Unit-IV

Handling Arrays: One-dimensional arrays, creating an array, two-dimensional arrays, variable-size arrays, System. Array class, Array List class.

Manipulating Strings: Creating strings, string methods, inserting strings using system, comparing strings, finding substrings, mutable strings, arrays of strings, regular expressions.

Structure and Enumerations: Structures, structs with methods, nested structs, differences between classes and structs, enumerations, enumerator initialization, enumerator base types, enumerator type conversion.

Unit-V

Classes and Objects: Principles of OOP, Definition of a class, adding variables, adding methods, member access modifiers, creating objects, accessing class members, constructors, overloaded constructors, static members, static constructors, private constructors, copy constructors, destructors, member initialization, the this reference, nesting of classes, constant members, read only members, properties, indexers.

Inheritance and Polymorphism: Classical inheritance, containment inheritance, defining a subclass, visibility control, defining subclass constructors, multilevel inheritance, hierarchical inheritance, overriding methods, hiding methods, abstract classes, abstract methods, sealed classes, sealed methods, polymorphism.

Unit-VI

Interfaces: Multiple Inheritances: Defining an interface, extending an interface, implementing interfaces, interfaces and inheritance, explicit interface implementation, abstract class and interfaces.

Operator Overloading: Operator overloading, need of operator overloading, unary operators, overloading binary operators, comparison operators.

Delegates and Events: Delegates, delegate declaration, delegate methods, delegate instantiation, delegate invocation, using delegates, multicast delegates, events.

Managing Console I/O Operations: Console class, console input, console output, formatted output, numeric formatting, standard numeric format, custom numeric format.

Managing Error's and Exceptions: Types of errors, exceptions, syntax of exception handling code, multiple catch statements, the exception hierarchy, general catch handler, using finally statement, nested try blocks, throwing our own exceptions, checked and unchecked operators, using exceptions for debugging.

References:

1. E Balagurusamy,(2002*), Programming in C#*, Tata McGraw-Hill Publishing Company Ltd.
2. Stephen Randy Davis and Chuck Sphar(2005),*C# for DUMMIES*, Wiley Publishing.
3. Jeff Ferguson, Brian Patterson, Jason Beres, Pierre Boutquin, and Meeta Gupta, "C# Bible

Course Name: Relational Database Management Systems

Course Code: 102503

Semester: 5th

L T P

Credits:04 **3 1 0**

Course Contents

Unit-I

Database Management: Introduction, Types of DBMS and their advantages and disadvantages, Characteristics of Database Approach, Data Models, Data Abstraction and Knowledge Representation, Database Language, Overview of Recovery and Backup, Normalization & its forms.

Unit-II

DBMS Architecture and Data Independence: Attributes and Keys, Relationships, Relationship Types, Roles, ER Diagrams, Relational Model concepts, functional dependence.

Unit-III

SQL, PL SQL, SQL *PLUS, Managing Database and Queries: Creating, Defining and Modifying Table structure, Update Operations and Dealing With Constraint Violations, Basic Relational Algebra Operations, Example of Queries in Relational Algebra, The Tuple Relational Calculus, The Domain Relational Calculus, granting and revoking privileges.

Unit-IV

SQL Server: Introduction to SQL Server and Oracle Server, Indexes, Views, Cursors, Packages, Triggers, Stored Procedures.

References:

1. Navathe and Elmasri. (2011). *Fundamentals of Database System.*Pearson Education,Delhi.
2. Korth and Silberschatz Abraham.(2009) .*Database System Concepts*. McGrawHall.
3. C.J.Date, A.Kannan and S.Swamynathan. (2004). *Introduction of Database Systems*. Pearson Education, Delhi.
4. Ivan Bayross.(2009) .*SQL, PL/SQL The programming language of Oracle*. BPB Publication,Delhi.

Course Name: Software Engineering

Course Code: 102504

Semester: 5th

	L	T	P
Credits:04	**3**	**1**	**0**

Course Contents

Unit-I

Introduction: The software engineering, Discipline-Evolution and impact, Why study software Engineering , Emergence of software Engineering.

Unit-II

Software Life Cycle Models: Why use a lifecycle model? Classical waterfall Model, Iterative, Prototype, Evolutionary, Spiral Models & their Comparison.

Unit-III

Software Project Management: Project Planning, Metrics for Project Size estimation- LOC and Function- Point & Feature Point, Project Estimation Techniques, COCOMO Model, Team Structure, Software Configuration Management.

Unit-IV

Requirements Analysis and Specification: Software Requirement Specifications (SRS),Software project management, Project planning and control, cost estimation, project scheduling using PERT and GANTT charts, cost-time relations: Rayleigh-Norden results, quality Management

Unit-V

Software Design: Issues in software Design, Function oriented design, Object oriented Design, Object Modeling Using UML, and User interface Design.

Unit-VI

Coding and Testing: Code review, Verification and validation, Unit testing, Black Box Testing, Integration and System Testing. Verification and validation, Integration testing, Validation testing, alpha and beta testing, System testing: Recovery testing, security testing, stress testing, performance testing; The art of debugging, process debugging approaches. Software re-engineering: Reverse engineering, restructuring, forward engineering

Unit-VII

Software Reliability and Quality Assurance: Quality concepts, Software quality assurance : SQA activities; Software reviews; cost impact of software defects, defect amplification and removal; formal technical reviews: The review meeting, review reporting

record keeping, review guidelines; Formal approaches to SQA; Software Maintenance: Characteristics of Software maintenance,

References:

1. Ghezzi C., Jazayeri M. And MandrioliD(1991).*Fundamentals of Software Engineering*. Prentice Hall, N. J.
2. Pfleedger S. L.(1991). *Software Engineering: The Production of Quality software*.Second Edition, Macmillan PublishingCompany.
3. Oehm B. W.(1988). *A Spiral Model of Software Development and Enhancement*. IEEE Computer, 21.pp61-72.
4. Fairley R.(1985).*Software Engineering Concepts*. McGraw Hill, NewYork.

Course Name: Wireless Networks

Course Code: 102505

Semester: 5th

	L	T	P
Credits:04	**3**	**1**	**0**

Course Contents

Unit-I

Introduction to Wireless Networks: IEEE Standards for Wireless Networks .Wireless Networks Applications. Types of Wireless Networks.Benefits of Wireless Networks.

Wireless System Architecture: Wireless System Components. Network Architecture Information Signals.

Unit-II

Radio Frequency and Light Signal Fundamentals: Wireless Transceivers, Understanding RF Signals, Working of Light Signals, Modulation: Sending Data packets in the Air.

Types of Wireless Networks: WPAN, WLAN, WMAN.

Unit-III

Wireless LAN: Meaning, Components: User Devices, Radio NIC's, Access Points, Routers, Repeaters, And Antennae.

802.11 Protocol Stack : Physical Layer , MAC Layer : Hidden Station , Exposed Station Problem ,Services offered by wireless LAN , SOHO Applications: Internet Access, Printing, Remote Accessing, Public Wireless LANs , AdHoc WirelessLAN's.

Unit-IV

Wireless WAN: WAN User Devices, Wireless WAN Systems: Cellular-Based Wireless WANs, First-Generation Cellular, Second-Generation Cellular, Third Generation Cellular, SMS Application. Space-Based Wireless WANs: Satellites, Meteor Burst Communications .Wireless WAN Technologies: FDMA, TDMA, CDMA, SDMA.

Unit-V

Wireless Networks Security: Security Threats,, Traffic Monitoring & Devices, Unauthorized Access, Middle Attacks , DoS Attack (Denial of Service). Protective Actions: WEP, WEP issues, WPA, VPN. Authentication, 802.11 Authentication Vulnerabilities, MAC Filters and usage, Authentication Using Public Key Cryptography, 802.1x standards, Security Policies.

Reference Books:

1. KavehPahlavan.(2002). *Principles of Wireless Networks* .Pearson Education.
2. William Stallings.(2014).*Wireless Communication & Networks.* PearsonEducation".
3. Andrew S. Tanenbaum.(2002).*Computer Networks.* PrenticeHall".

Course Name: Computer Graphics Lab

Course Code: 102506

Semester: 5th

	L	T	P
Credits:01	**0**	**0**	**2**

Course Contents

List of Experiments:

Task 1: WAP to draw different geometric structures using different functions.

Task 2: Implement DDA line generating algorithm.

Task 3: Implement Bresenham's line generating algorithm.

Task 4: Implement Mid-point circle line generating algorithm.

Task5:Implementation of Bresenham's circle drawing algorithm.

Task 6: Implementation of mid-point circle generating Algorithm.

Task 7: Implementation of ellipse generating Algorithm.

Task 8: WAP of color filling the polygon using Boundary fill and Flood fill algorithm.

Task 9: To translate an object with translation parameters in X and Y directions.

Task 10: To scale an object with scaling factors along X and Y directions.

Task 11: Program of line clipping using Cohen-Sutherland algorithm.

Task 12: To perform composite transformations of an object.

Task 13: To perform the reflection of an object about major.

Course Name: Programming using C#.net Lab

Course Code: 102507

Semester: 5th

	L	T	P
Credits: 02	**0**	**0**	**4**

Course Contents

List of Lab Practical's

1. Console based Programming.
2. Introducing form oriented programming.
3. Implement the concept of Classes and Objects
4. Implement the concept of Inheritance and Polymorphism
5. Implement the concept of Interfaces
6. Implement the concept of Operator Overloading
7. Implement the concept of Delegates and Events
8. Implement the concept of Managing Console I/O Operations
9. Implement the concept of Managing Errors 'and Exceptions.

Course Name: Relational Database Management Systems Lab

Course Code: 102508

Semesters: 5th

	L	T	P
Credits:01	**0**	**0**	**2**

Course Contents

1. Installation of SQL Server / Oracle through oracleinstaller.
2. Data Types, Creating tables, Insertion of data, Retrieval of data using SelectStatement, Alter, Drop ,Update and Delete Statements, OracleFunctions.
3. Use of constraints, Clauses, Sub queries, Joins, Sequences, Views, Indexes, Database Security and Privileges: Grant and Revoke Commands, Commit and RollbackCommands
4. PL/SQL Architecture, Writing PL/SQL Code, control structures of PL/SQL likeIf-else Statement, program using loops of PL/SQL like For, Do-while and whileloop.
5. Triggers, Stored Procedures, Cursor and Oracle Packages Management inPL/SQL.

Course Name: Algorithm Analysis and Design

Course Code: 102601

Semester: 6th

	L	T	P
Credits:05	**4**	**1**	**0**

Course Contents

Unit-I

Models of Computation: Algorithm analysis, Order arithmetic, Space and Time complexity measures, Lower and Upper Bounds, Average and Worst case analysis.

Unit-II

Algorithm design technique: The Greedy method, Divide-and-Conquer, Dynamic Programming, Backtracking, Branch and Bound.

Unit-III

Sorting and Searching Algorithm: Combinatorial Algorithms, String Processing Algorithm, Algebraic Algorithm.

Unit-IV

Graph Algorithms: Connectivity, Strong connectivity, Biconnectivity, Topological sort, Shortest paths, Minimum Spanning trees, Network flow.

Unit-V

Manipulation The Disjoint set union problem, find problem.

Unit-VI

Problem Classes

P, NP, NP-Hard, NP-Complete, Deterministic, Nondeterministic Polynomial time Algorithm.

Unit-VII

Approximation Algorithm: Introduction to Approximate algorithms and Randomized algorithms, Approximation algorithm for some NP-CompleteProblem.

References:

1. A Aho, J E Hop croft and J D Ullman.(1974).*The Design and Analysis of Computer Algorithms*.Addison-Wesley.
2. S Sahni.(2001).*Data Structures, Algorithms and Applications in C++*.McGraw-Hill.
3. M T Goodrich and R Tamassia.(2001).*Algorithm Design: Foundations, Analysis and Internet Examples*. John Wiley &Sons.

Course Name: Human Resource Management

Course Code: 102602

Semester: 6th

	L	T	P
Credits:04	**4**	**0**	**0**

Course Contents

Unit-I

Introduction: Meaning, scope, objectives and importance of Human Resource Management, Personnel Management, its functions, policies & roles, Organizing the Human Resource Management department in the organization, Human Resource Management practices in India, HRaudit.

Unit-II

Procurement and Placement: Need for Human Resource Planning; Process of Human Resource Planning; Methods of Recruitment; Psychological tests and interviewing, Meaning and Importance of Placement and Induction, Employment Exchanges (Compulsory Notification of vacancies) Act 1959, The Contract Labor (Regulation & Abolition) Act 1970.

Unit-III

Training & Development: Principles of Training and Development; Difference between Training and Development; Promotion: Promotion-Merit v/s seniority wise; Performance Appraisal, Career Development &Planning.

Unit-IV

Job analysis & Design: Job Analysis and its Principle: Job Specification & Job Description, Difference between Job Specification Job Description.

Unit-V

Job Satisfaction: Meaning, objectives and importance Job satisfaction;

Unit-VI

Motivation: Factors affecting motivation, Motivation Theory: Maslow's Motivation Theory, Hertzberg Hygiene Theory; Workers ' Participation in the organization, Quality of work life.

Unit-VII

Bonus and Incentives: Meaning, objectives and importance of Bonus and Incentives.

Unit-VIII

The Wage Act and Compensation Function: Basic concepts in wage administration, company's wage policy, Issues in wage administration, Payment of Wages Act- 1936, Minimum Wages Act-1961.

Unit-IX

Integration and Human Relation: Meaning, objectives and importance of Integration in industry. Human Relations and Industrial Relations; Difference between Human Relations and Industrial Relations, Factors required for good Human Relation Policy in Industry;

Unit-X

Employees Grievances: Employee Employer relationship Causes and Effects of Industrial disputes;, Administration of Discipline, Absenteeism, Labor Turnover, Changing face of the Indian work force and their environment, Importance of collective Bargaining; Role of trade unions in maintaining cordial Industrial Relations.

Unit-XI

Welfare of Employees: Welfare of Employees and its Importance; Fringe & retirement terminal benefits, administration of welfare amenities, Meaning and Importance of Employee Safety, Accidents-Causes & their Prevention, Safety Previsions under the Factories Act 1948;, Social security, Family Pension Scheme, ESI act 1948, Future challenges for Human ResourceManagement.

Reference Books:

1. R.C. Saxena.(2002).*Labour Problems and social welfare*. K.Math&Co.
2. A Minappa and M. S. Saiyada.(1991). *Personnel Management*. Tata Mc.Graw-Hill.
3. C.B. Mamoria.(2004*).Personnel Management*. Himalaya Publishing House,Bombay.

Course Name: Java Programming

Course Code: 102603

Semester: 6th

L T P

Credits:05 **4 1 0**

Course Contents

Unit-I

An overview of Java: Object oriented programming, Two paradigms, abstraction, the OOP principles, Java class libraries

Date types, variables and arrays:-Integers, floating-point types, characters, Boolean, Iterates, Variable, Data types and casting, array operators.

Operators:- Arithmetic operators, bit wise operators, relational operators, Boolean logical operators, assignment operators, operator precedence

Control statements: - Java's selection statements, iteration statements, jump statements.

Unit-II

Introduction to classes: Class fundamentals, declaring object reference variable, Introducing methods, constructors, the keywords, garbage collection, the finalize () method.

Methods and Classes:-Overloading methods, using objects as parameters, recursion.

Inheritance: Inheritance basics, using super, method overriding, dynamic method dispatch, using abstract Classes, Using final with inheritance, Package and Interfaces, Package asses protection, importing packages

Unit-III

Exception handling: Exception handling fundamentals, Exception types, Uncaught Exceptions, Using try and catch, multiple catch clauses, nested try statements throw, and finally Java built in exception creating your own exception, sub classes, using exceptions.

Unit-IV

Multithreaded Programming: The Java thread model, the main thread, creating thread, creating

multiple thread, using is alive () and join (). Thread priorities, synchronization, Inter thread communications, suspending resuming and stopping thread using multithreading.

String handling: The string constructor, string length, special string operator character extraction, string comparison, searching string, modifying string, data conversion, changing the case of characters, string buffer.

Unit-V

Networking: Networking basics, Java and the Internet Address, TCP/IP client Sockets URL, URL connection, TCP/IP server Sockets, the AppletClass.

Unit-VI

The Applet Class: its architecture displays method, The HTML APPLET, Passing parameters to Applet. The get Documentation Base () and get Code Base () methods Applet Context and Show Document ().

References:

1. Scheldt.(2004). *Java 2 Computer Reference*. Tata McGrawHill
2. Horstmann. (2018) .*Core Java-1.*, Addison Wesley.
3. E Balagurusami.(2007). *Programming with JAVA.*
4. Bruce Eckel.(2006).*Thinking in Java.*

Course Name: Open Source Software

Course Code: 102606

Semester: 6th

	L	T	P
Credits:05	**4**	**1**	**0**

Course Contents

Unit-I

History and Emergence of Open Source Software: The philosophy of OSS, Richard Stallman, the Cathedral and the Bazaar (CatB), commercial software vs. OSS, free software vs. freeware, Open source development models, Application Programming Interface (API), GNU Project, Free software Foundation.

Unit-II

Community Building: Importance of Communities in Open Source Movement, JBoss Community, Developing blog, group, forum, social network for social purpose.

Unit-III

Open Standards: National Information Standards Organization (NISO), The Digital Library Federation (DLF), The Dublin Core Metadata Initiative, MARC standards, Resource Description and Access (RDA), Open Archives Initiative, OAI-PMH, Search/ Retrieval via URL (SRU), SRW/CQL, Java platform, Enterprise Edition (Java EE).

Unit-IV

Open Source Licenses: GNU General Public Licenses (GPL) version 2.3, GNU Lesser General Public License (LGPL) version 2.1, 3, GNU Affero General Public License (AGPL) version 3, Apache License version 2.0, Artistic License 2.0, etc.

Unit-V

Operating system: The Linux operating system and its use both for desktops and as server software.

Unit-VI

Web Server: Apache HTTP Serevr and its flavors, WAMP server (Windows, Apache, MySQL, PHP), Open Source MySQL, Apache, MySQL, PHP, JAVA as development platform.

Unit-VII

Open Source Software: Category of Open Source Software, OSS for Podcasts, RDBMS, online social networks, etc. open source bibliometics softwares likes pajek, ucinet, etc.

Course Name: Multimedia and application

Course Code: 102607

Semester: 6th

	L	T	P
Credits:05	**4**	**1**	**0**

Course Contents

Unit-I

Introduction To Multimedia Technology - computers, communication and entertainment framework for multimedia system, features of multimedia system, Multimedia Hardware devices& software development tools,, M/M devices, presentation devices and the user interface, M/M presentation and authoring.

Unit-II

Digital Representation Of Sound And Image:-Digital representation of sound and transmission, Basics of Video, ,Types of Video Signals, Analog Video, Digital Video, brief survey of speech recognition and generation, digital video and image compression, JPEG image compression standard, MPEG motion video compression, DVI technology, timbered media representation and delivery.

Unit-III

M/M Software:-M/M software environments, limitations of workstation operating systems, M/M system services, OS support for continuous media applications, media stream protocol, M/M file system and information representation system, and data models for M/M and hypermedia information.

Unit-IV

Application Of M/M:-Application of M/M, intelligent M/M system.

Unit-V

Virtual Reality System: Desktop VR, virtual reality OS, distributed virtual environment system, virtual environmental displays and orientation tracking, visually coupled systems requirements,

intelligent VR software systems.

Unit-VI

Uses: - Applications of environments in various fields such as medical entertainment, manufacturing, business, education etc.

References:

1. Stephen McGloughlim. (2002). *Multimedia on the Web*.PHI.

2. Villamil-Casanova &Nolina .(2003) .*Multimedia production, planning &Delivery*.PHI.

3. Lozano.(2003) .*Multimedia sound &video*.PHI.

4. J. Jeefcoate.(2004).*Multimedia in Practice Tech &application*.

Course Name: Linux Administration System

Course Code: 102608

Semester: 6th

	L	T	P
Credits:05	**4**	**1**	**0**

Course Contents

Unit-I

Introduction

Overview of Linux, Relation between GNU and Linux, The heritage of Linux: UNIX, Additional features of Linux.

Unit-II

The Linux operating System

Getting started, logging in, Working with the shell, Super user Access, Finding documentation.

Unit-III

Command Line Utilities

Special characters, Basic utilities, Working with files, Communicating between processes, Compressing and Archiving Files, Locating commands, Obtaining user and system information, Communicating with other users, Email.

Unit-IV

The Linux File System

The Hierarchical File system, Directory and ordinary files, Working with Directories, Access Permissions.

Unit-V

The Shell

Command line, Standard input and output, Running a program in the background, Filename generation/Pathname Expansion.

Unit-VI

The Editors

The vim editor, History, Creating and Editing a file with vim, vim features, Command Mode: Moving the cursor, Input mode, Command Mode: Deleting and Changing Text, Searching and Substituting, Yank put and delete Commands, Reading and Writing Files, Setting Parameters.

Unit-VII

The Shells

The Bourne Shell: Background, Shell basics, Parameters and variables, process, History, aliases, Functions, Controlling Bash Features and Option, Processing the command line.
The TC Shell: Shell SCRIPT, Entering and leaving the TC shell, Common features of Bourne again and TC shells, Redirecting Standard Error.

Reference Books:

1. Arnold Robbins. (2004).*Linux Programming by Example: The fundamentals*. Pearson Publishers,India,.
2. Drew and Mike Harwood. (2001).*Linux + Certification Guide*.Tata Mc-Graw Hill Publishers,India.

Course Name: Algorithm analysis and design lab

Course Code: 102604

Semester: 6th

	L	T	P
Credits:01	**0**	**0**	**2**

Course Contents

1. Write a program to implement bubble sort algorithm by comparing its complexity.
2. Write a program to implement linear search algorithm by comparing it complexity.
3. Write a program to implement binary search algorithm by comparing its complexity.
4. Write a program to implement PUSH operation in stacks.
5. Write a program to implement POP operation in stacks.
6. Write a program to implement Queues.
7. Write a program to insert an element in the beginning of the linklist.
8. Write a program to delete an element from the middle of the linklist.
9. Write a program to implement the concept of queen's problem.

Course Name: Java Programming lab

Course Code: 102605

Semester: 6th

	L	T	P
Credits:01	**0**	**0**	**2**

Course Contents

Students are required to write a code snippet that covers the following objectives.

1	Introduction to JAVA, its features & basic program
2	Write a program for Operators in JAVA
3	Write a program to show use of IF-Else Statements in JAVA
4	Write a program use switch case in JAVA
5	Write a program to use looping in JAVA
6	Write a program to use methods in JAVA
7	Write a program to create class and objects
8	Write a program to use Method Overloading and Method Overriding
9	Write a program to use Final Keyword
10	Write a program to show Implementation of Array
11	Write a program to show Implementation of Inheritance
12	Write a program to show creation and use of package
13	Write a program to show use of Interface
14	Write a program to apply replace, concate methods on String

15 Write a program to sort strings of array

16 Write a program to Show Implementation of Threads

17 Write a program to create applet

18 Write a program to create applet with passing parameters

19 Write a program to show use of Exception Handling

20 Write a program to make usage of JAVA lang.awt package and design GUI.

21 Usage of event handling in Java GUI (Graphical user interface)programs

Course Name: Programming Mobile Devices

Course Code: 102609

Semester: 6th

	L	T	P
Credits:05	**4**	**1**	**0**

Course Contents

Students are required to write a code snippet that covers the following objectives.

Unit-I

Memory management- Design Patterns for Limited Memory , Memory Management in Mobile Java, Memory Management in example OS.

Unit-II

Applications- Workflow for Application Development, Techniques for Composing Applications, Application Models in Mobile Java, Case Study: Symbian OS Application Infrastructure.

Unit-III

Dynamic Linking- Implementation Techniques, Implementing Plugins, Managing Memory Consumption Related to Dynamically Linked Libraries, Rules of Thumbs for Using Dynamically Loaded Libraries, Mobile Java and Dynamic Linking.

Unit-IV

Concurrency- Infrastructure for Concurrent Programming, MIDP Java and Concurrency, Case Study: Symbian OS and Concurrency.

Unit-V

Resource Management- Resource- Related concerns in Mobile Devices, MIDP Java.

Unit-VI

Networking- MIDP Java and Web Services, Bluetooth Facilities with an example OS.

Unit-VII

Security- Secure Coding and Design, Infrastructure for Enabling Secured Execution, Security Features in MIDP Java, Case Study: Symbian OS Security Features.

Course Name: Web Designing & Development

Course Code: 102702

Semester: 7th

	L T P
Credits:04	**3 1 0**

Course Contents

Unit-I

Introduction to HTML: HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets; Introduction to JavaScript: Scripts, Objects in Java Script, Dynamic HTML with Java Script XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

Unit-II

Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's Web Servers and Servlets: Tomcat web server, Introduction to Servlets: Lifecycle of a Serverlet, JSDK, The Servelet API, Thejavax. servelet Package, Reading Servelet parameters, and Reading Initialization parameters. The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues

Unit-III

Introduction to JSP: The Problem with Servelet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat

JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations

Unit-IV

Database Access: Database Programming using JDBC, Studying Javax.sql.* package, Accessing a Database from a JSP Page, Application – Specific Database Actions, Deploying JAVA Beans in a JSP Page, Introduction to struts framework. One android application development

References:

1. Chris Bates.(2010). *Web Programming& building internet applications.* 2nd edition, WILEY Dreamtech

2. Patrick Naughton and Herbert Scheldt.(2013*). The complete Reference Java 2*.Fifth Edition by.TMH

3. Java Server Pages. (2003).Hans Bergsten, SPDO'Reilly.

4. Dietel and Nieto Dietel (2003)Internet and World Wide Web – How to program by PHI/Pearson Education Asia

Course Name: Major Project

Course Code: 102706

Semester: 7th

Credits: 04 **L T P**

0 0 8

Course Contents

1. Project should include following phases: System Analysis and Design.
2. Coding - Implementation Testing
3. It should be a working project Must have a future perspective
4. The Domain of project can be from Database
5. Application software
6. System software
7. Multimedia
8. Web Applications etc.
9. A complete project report must be submitted along with softcopy of project. Project report may include Requirements of Project, Flow Chart, DFD's, Coding and Test Results

Course Name: Artificial Intelligence

Course Code: 102707

Semester: 7th

	L	T	P
Credits:04	**3**	**1**	**0**

COURSE CONTENTS

Unit-I

Introduction: What is AI, Importance of AI, Early work in AI, Applications of AI.

Unit-II

Knowledge and its definition: Knowledge Representation: Prepositional logic, FOPL, Properties of Well-formed formulas, Conversion to Clausal form, Inference rules, Resolution principle.

Unit-III

Structured Knowledge: Introduction, Associate frame structures, Conceptual dependencies and scripts.

Unit-IV

Knowledge Organization and Manipulation: Concepts, Uninformed or Blind search, Informed search, Searching- And-OR graphs, Pattern Recognition, Recognition Classification process, Classification patterns, Recognizing and understanding speech.

Unit-V

Planning: planning as search, partial order planning, construction and use of planning graphs. Decision-Making: basics of utility theory, decision theory, sequential decision problems, elementary game theory, sample applications.

Unit-VI

Expert System: Definition, Rule based architecture, dealing with uncertainty, Knowledge

acquisition and validation, knowledge system building tools.

Unit-VII

Knowledge Acquisition: Types of learning, General Learning model, Performance measures. Learning nearest neighbor, naive Bayes, and decision tree classifiers,

References

1.Peter Jackson.(1999).*Introduction to Expert System*. Addison Wesley

Course Name: Environmental Science

Course Code: 100302

Semester: 7th

L T P

Credits: 04 **3 1 0**

Course Contents

Unit-I

Introduction: Definition and scope and importance of multidisciplinary nature of environment. Need for public awareness.

Unit-II

Natural Resources: Natural Resources and associated problems, use and over exploitation, case studies of forest resources and water resources.

Unit-III

Ecosystems: Concept of Ecosystem, Structure, interrelationship, producers, consumers and decomposers, ecological pyramids-biodiversity and importance. Hot spots of biodiversity

Unit-IV

Environmental Pollution: Definition, Causes, effects and control measures of air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution,

Nuclear hazards. Solid waste Management: Causes, effects and control measure of urban and industrial wastes. Role of an individual in prevention of pollution, Pollution case studies.

Unit-V

Disaster Management : Floods, earthquake, cyclone and landslides.

Unit-VI

Social Issues and the Environment: From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns.Case studies. Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.Wasteland reclamation.Consumerism and waste products. Environment Protection Act.Air (Prevention and Control of Pollution) Act.

Water (Prevention and control of pollution) Act. Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation Public awareness.

Unit-VII

Human Population and the Environment: Population growth, variation among nations. Population explosion – Family Welfare Programme. Environment and human health, Human Rights, Value Education, HIV/AIDS. Women and child Welfare. Role of Information Technology in Environment and human health. Case studies

References/Text Books

1. Agarwal, K. C.(2008).*Environment Biology*.Nidi Publ. Ltd.Bikaner.

2. Jadhav, H &Bhosale.(1991).*V.M. Environment Protection and Laws*. Himalaya Pub House,Delhi

3. Rao M. N. &Datta A.K.(2017*). Waste Water Treatment*. Oxford & IBH Publ. Co. Pvt.Ltd.

Course Name: Parallel Computing

Course Code: 102708

Semester: 7th

L T P

Credits:04 **3 1 0**

Course Contents

Unit-I

Introduction and classification of parallel computer:-Parallel processing terminology, Flynn's and Handler's classifications, Amdahl's law, Gaussian Laws.

Unit-II

Introduction to Pipelined and Vector Processors: - Instruction pipelining, branch control techniques, Reservation table, Data and control hazards and methods to remove them.

Unit-III

Introduction to SIMD or Array Processors:-Various interconnection networks, types of Data routing through networks, Comparison of Various networks.

Unit-IV

Introduction to MIMD and Multi Processor Systems Uniform and non-uniform memory access multi processors, Scheduling in multi processors systems, Load balancing in multi processors systems.

Unit-V

PRAM model of Parallel Computing and Basic Algorithms PRAM model and its variations, Relative powers of various PRAM models.

Unit-VI

Parallel Algorithms for Multi-Processor Systems and SIMD Processor System: Basic construction for representing PRAM algorithm, Parallel reduction algorithm, Parallel prefix computing, Parallel list ranking, Parallel merge, Brent's theorem and cost optimal algorithm, NC class of parallel algorithms. Introduction to parallel algorithms for SIMD.

References Books:

1. S. G. Akl, Prentice Hall EdglewoodCliff NJ.(2014).*Design and Analysis of Parallel algorithms.*McGraw Hill.
2. S Lakshmivarahan and S. K. Dhall.(2014). *Analysis and Design of Parallel Arithmetic-Arithmetic and Matrix Problems*. McGraw Hill.

Course Name: Management Information System Lab

Course Code: 102704

Semester: 7th

	L	T	P
Credits:02	**0**	**0**	**4**

Course Contents

Students have to perform case studies and give seminars on the following topics:

1. Study of MIS and its concept in details.
2. Study of Physical and conceptual structure of MIS.
3. Study of DSS, its user and classes with Simon's Model.
4. Study of GDSS, its users and classes.
5. Study of Information System and its types.
6. Study of System and its Kinds.
7. To discuss the concept of organization.
8. Study of ERP and implementation.
9. ERP life cycle model and scope of ERP in Marketing.

Course Name: Automata Theory

Course Code: 102701

Semester: 7th

	L T P
Credits: 04	**3 1 0**

Course Contents

Unit-I

Finite Automata : Finite State Systems, Basic Definitions Non-Deterministic finite automata (NDFA), Deterministic finite automata (DFA), Equivalence of DFA and NDFA Finite automata with ε-moves, Conversion of NFA to DFA.

Unit-II

Introduction to Machines: Concept of basic Machine, Properties and limitations of FSM. Moore and mealy Machines, Equivalence of Moore and Mealy machines.

Unit-III

Regular Expressions: Regular Expressions, Equivalence of finite automata and Regular Expressions, Regular expression conversion and vice versa.

Unit-IV

Regular Sets: The Pumping Lemma for Regular Sets, Applications of the pumping lemma, Closure properties of regular sets, Myhill-Nerode Theorem and minimization of finite Automata, Minimization Algorithm.

Unit-V

Grammars and their Normal forms: Definition, Context free and Context sensitive grammar, Ambiguity regular grammar, reduced forms, Removal of useless Symbols and unit production, Chomsky Normal Form (CNF), Griebach Normal Form (GNF).

Unit-VI

Chomsky Hierarchies: Chomsky hierarchies of grammars, Unrestricted grammars, Context sensitive languages, Relation between languages of classes.

Unit-VII

Pushdown Automata: Introduction to Pushdown Machines, Application of Pushdown Machines, Pushdown free Automata and context languages.

Unit-VIII

Turing Machines: Introduction to Turing machines, Deterministic and Non- Deterministic Turing Machines, Design techniques of T.M, Halting problem of T.M., PCP Problem, and Linear bounded automata and Languages.

Computability: Basic concepts, Primitive Recursive Functions.

Reference Books:

1. Hopcroaft&O.D.Ullman.(2001*). Introduction to automata theory, language & computations*R Mothwani, ,AW

2. John C. Martin (2003).Introduction to languages and the Theory of Computation.ByT.M.H.

Course Name: Web Designing & Development Lab

Course Code: 102705

Semester: 7th

	L	T	P
Credits:02	**0**	**0**	**4**

Course Contents

1. Create a basic web page to show use of head, title, and bodytag.
2. Create a web page to show use heading and text formattingtags.
3. Create a web page to show use img, ul, ol and anchors.
4. Create a web page to show use tables and divtags.
5. Create a web page using class, id and inlinestyles.
6. Create a web page to create a form.
7. Create a web page to show an alert using javascript.
8. Show the use of get Element By Id in javascript.
9. Create a web page using variables, loop and Conditions in java script.
10. Create a web page using Switch in javascript.
11. Create a web page to show use of jquery.
12. Create a web page to implement get & post inAjax.
13. Create a web page to print your name using PHP.
14. Create a web page to show use of all data types in PHP
15. Create a web page to show use loops & Conditional Statements.
16. Create a web page to show use arrays in PHP.
17. Create database and tables in MySQL.
18. Fetch and display data from MySQL table in a web page using PHP.
19. File upload to server using PHP.
20. Working with cookies and sessions.

Course Name: Management Information Systems

Course Code: 102703

Semester: 7th

	L	T	P
Credits:04	**3**	**1**	**0**

Course Contents

Unit-I

Learning of MIS: Definition and Significance of MIS, Importance, Concept, Function, Characteristic, Evaluation of MIS, IT and MIS, Three Levels of Management Activity.

Unit-II

Structure and Classification of MIS: Structure of MIS, MIS classification, Functional Information System, Conceptual and Physical Structure of MIS.

Unit-III

Decision Making System: Simon's Model, Characteristics of DSS, Structure of DSS, DSS users, Classes, Types, Decision Tree. GDSS Model, Characteristics of GDSS, users and classes of GDSS, difference between DSS and GDSS

Unit-IV

Information and System Concept: Definition of information, Quality of Information, information parameters, types and dimension of Information, Classification of information system maintenance. Definition of system, kinds of system, elements of system

Unit-V

Organization concept: Definition of Organization, Database Hierarchy and Files used in Organization

Unit-VI

Introduction to ERP : Definition and Significance of ERP, Benefits of ERP, ERP Implementation, ERP life Cycle Model, Role of users, Vendors and Consultants in ERP, Marketing of ERP, Future Scope of ERP Application.

References:

1. D.P Goyel.(2006). *Management Information Systems: Managerial Perspectives.* Macmillan.
2. John C. Martin Vinod Kumar Garg, N. K. Venkitakrishnan(CVS Murthy.)(2003).*Enterprise Resource Planning: Concepts and Practice* by, Phi Learning Pvt.Ltd

Total Number of Course	63
Number of Theory Course	37
Number of Practical Course	24
Number of Theory as well as Practical Course	2
Total Number of Credits	208

Annexure-4

ACADEMIC INSTURCTIONS

Attendance Requirements

A student shall have to attend 75% of the scheduled periods in each course in a semester; otherwise he / she shall not be allowed to appear in that course in the University examination and shall be detained in the course(s). The University may condone attendance shortage in special circumstances (as specified by the Guru Kashi University authorities). A student detained in the course(s) would be allowed to appear in the subsequent university examination(s) only on having completed the attendance in the program, when the program is offered in a regular semester(s) or otherwise as per the rules.

Assessment of a course

Each course shall be assessed out of 100 marks. The distribution of these 100 marks is given in subsequent sub sections (as applicable).

	Internal (50)						External (50)	Total
Components	**Attendance**	**Assignment**			**MST1**	**MST2**	**ETE**	
		A1	A2	A3				
Weightage	10	10	10	10	30	30	50	
Average Weightage	10	10			30		50	100

Passing Criteria

The students have to pass both in internal and external examinations. The minimum passing marks to clear in examination is 40% of the total marks.