WEST BENGAL STATE COUNCIL OF TECHNICAL & VOCATIONAL EDUCATION AND SKILL DEVELOPMENT

(A Statutory Body under West Bengal Act XXVI of 2013)
(Technical Education Division)
Karigari Bhavan, 4th Floor, Plot No. B/7, Action Area-III, Newtown, Rajarhat, Kolkata–700 160

WBSCTVESD Curriculum for Diploma Courses in Engineering and Technology

Semester I
(Common to all Branches)

Sl. No	Category of Course	Course Title	Hours per week			Total contact hrs/ week	Credits	Marks
			L	T	P			
1.	Basic Science	Mathematics-I	2	1	0	3	3	100
2.	Basic Science	Applied Physics-I	2	1	0	3	3	100
3.	Basic Science	Applied Chemistry	2	1	0	3	3	100
4.	Humanities & Social Science	Communication Skills in English	2	0	0	2	2	100
5.	Engineering Science	Engineering Graphics	0	0	3	3	1.5	100
6.	Engineering Science	Engineering Workshop Practice	0	0	3	3	1.5	100
7.	Basic Science	Applied Physics-I Lab	0	0	2	2	1	100
8.	Basic Science	Applied Chemistry Lab	0	0	2	2	1	100
9.	Humanities & Social Science	Sports and Yoga	0	0	2	2	1	100
10.	Humanities & Social Science	Communication Skills in English Lab	0	0	2	2	1	100
	Total Credits and Marks						18	1000

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Syllabus for Engineering Mathematics-I

Course Title:	Engineering Mathematics-I
Course Code:	BS101/M-I
Number of Credits :	3(L: 2+1: T) P: 0
Pre Requisites :	1) Basic Formulae of Algebra, Trigonometry should be known 2) Preliminary knowledge of the vector
Total Contact Hours :	45 hrs.

Aim: Engineering Mathematics is the backbone of engineering students. The curriculum of mathematics has undergone changes from time to time in accordance with the need of engineering branches. The revised syllabus has been designed keeping in view the emerging needs of all categories of students. Great emphasis has been laid on the application of various contents like algebra, complex numbers, vectors, trigonometry and derivative. This course will develop analytical abilities to make exact calculations and provide a continuing educational base for the students.

Course Objectives: After the completion of the course the students will be able to

- ➢ apply the basic concepts of logarithm, complex number, quadratic equation and binomial theorem for solving the engineering and practical problems.
- ➢ find the solutions of vector oriented problems like work done, moment etc by applying vector algebra.
- ➢ simplify trigonometric expressions and solve trigonometric equations which will be useful in solving the scientific problems.
- ➢ analyze limit, continuity, derivatives of different functions and physical interpretation of derivatives which will be applicable in real situation.

Course Content

Unit-1

Algebra

1.1 Logarithm: 3 Hours

1.1.1 Definition of natural and common logarithm.

1.1.2 General Properties of logarithm and simple problems

1.2 Complex Numbers: 5 Hours

1.2.1 Definition of Complex numbers, Real and Imaginary parts of a complex number, Equality of two complex numbers, Conjugate of a complex number

1.2.2 Modulus and Argument of a complex number and simple problems

1.2.3 Polar and Cartesian forms of a complex number and their relation.

1.2.4 Algebraic operations (Addition, Subtraction, multiplication, Division) of complex numbers

1.2.5 De Moivre's Theorem (without proof) and simple problems.

1.2.6 Cube roots of unity and their properties with problems.

1.3 Quadratic Equations: 4 Hours

1.3.1 Definition of Quadratic Equations.

1.3.2 Finding the roots of a quadratic equation, conjugate roots& simple problems

1.3.3 Nature of the roots using discriminant & problems

1.3.4 Relation between roots and co-efficients & problems

1.3.5 Formation of quadratic equations if roots are given.

1.4 Binomial Theorem: 4 Hours

1.4.1 Definition of factorial of a number, permutation(n_{P_r})& combination (n_{C_r}) with formula only

1.4.2 Binomial Theorem (without proof) for any index, simple problems on positive index only

1.4.3 General Term and Middle Term and problems

1.4.4 Expansion of$(1 + x)^{-1}, (1 - x)^{-1}, where\ |x| < 1$, exponential & logarithmic series only (no problem)

Unit-2

Vector Algebra   7 Hours

2.1 Definition of vector and types of vectors

2.2 Concept of a position vector and Ratio formula& simple problems

2.3 Rectangular resolution of a vector

2.4 Equality, addition, subtraction of vectors and multiplication of a vector by a scalar

2.5 Scalar (dot) and Vector (cross) product of two vectors with properties & simple problems

2.6 Application of dot product -- work done by a force, projection of a vector upon another

2.7 Application of cross product -- finding area of a triangle and parallelogram, moment of a force

Unit-3

Trigonometry   10 Hours

3.1 Concept of trigonometrical angles, measurement of angles in degree, radian and grade & their relation only.

3.2 Trigonometrical ratios of angles, associated angles, Trigonometric ratios of some standard angles, problems

3.3 Compound angles formula (without proof), multiple, sub-multiple angles & simple problems

3.4 Solutions of Trigonometrical Equations, simple problems (angle lies between 0 and 2π)

3.5 Inverse Circular Function & simple problems

3.6 Properties of triangle, basic formulae only

Unit-4

Function, Limit & Continuity, Derivative

4.1 **Function**   2 Hours

4.1.1 Definition of variables & constants

4.1.2 Definition of function with examples, domain and range of a function

4.1.3 Types of functions (even-odd, increasing-decreasing, inverse, periodic) with simple examples

4.1.4 Graph of trigonometric functions, sin x, cos x, tan x only

4.2 **Limit & Continuity**   2 Hours

4.2.1 Definition of limit (with left hand limit & right hand limit), Fundamental Theorem on limit (only statement), standard limits and simple problems

4.2.2 Continuity of functions, elementary test for continuity of functions (finite limit)

4.3 **Derivative**   8 Hours

4.3.1 Definition of derivatives

4.3.2 Derivatives of standard functions

4.3.3 Rules of differentiation of sum, difference, product and quotient of functions.

4.3.4 Derivatives of composite functions (Chain Rule)

4.3.5 Derivatives of inverse circular functions, implicit functions and logarithmic differentiation

4.3.6 Derivative of parametric functions, derivative of a function with respect to another function

4.3.7 Second order derivatives with simple problems

4.3.8 Application of derivatives –Physical & Geometrical interpretation of derivative, checking increasing-decreasing functions, finding velocity & acceleration, Maxima-Minima of function of single variable with simple problems.

Examination Scheme:

A. Semester Examination pattern of 60 marks:

1. Objective questions- 20 marks (1 mark each question), (At least 5 question from each **group**)
2. Subjective questions- 40 marks (at least 2 questions of 10 marks from each **group**)

- **Group- A** contains Unit-1 & Unit-2 (At least 40 marks); **Group-B** contains Unit-3 (At least 20 marks); **Group-C** contains Unit-4(At least 20 marks)

N.B.- Student will answer objective type questions of 20 marks and for subjective question of 40 marks, taking at least one question from each **group** of the above three **groups**.

B. For the internal Assessment 40 marks:

1. Class Test Examination/Internal Examination; 20 marks; choose best two out of three Class Test Examinations/ Internal Examinations
2. Class Attendance; 10 marks
3. Viva/ Quiz/Presentation/Assignment/Project/Report etc.; 10 marks

Text Books & Reference -

1. Higher Engineering Mathematics, B. S. Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics, Konch & Dey, Bhagabati Publication
3. Engineering Mathematics, Babu Ram, Pearson
4. Trigonometry, S.L.Loney, S.Chand & Co.
5. Higher Algebra, H. S. Hall & Knight, Book Palace, New Delhi
6. Advanced Engineering Mathematics, E. Kreyszig, Wiley
7. Engineering Mathematics, A. Sarkar, Naba Publication
8. Diploma Engineering Mathematics, B. K. Paul, U.N.Dhar & Sons
9. Analytic Geometry Two & Three Dimensional and **Vector Analysis**, R. M. Khan, New Central Book Agency
10. Higher Algebra: Classical, S.K. Mapa, Sarat Book House
11. Introduction to Real Analysis, S.K. Mapa, Sarat Book House
12. Engineering Mathematics, Reena Garg, Khanna Publishing House, New Delhi
13. Calculus and Analytic Geometry, G. B. Thomas, R. L. Finney, Addison Wesley
14. Engineering Mathematics, V. Sundaram, R. Balasubramanian, K.A. Lakshminarayanan, Vikas Publishing House.
15. Advanced Engineering Mathematics, Reena Garg & Chandrika Prasad, Khanna Publishing House, New Delhi
16. Web portal: https://www.ndl.gov.in/homestudy/science
 https://ncertbooks.ncert.gov.in/login
 https://epathshala.nic.in//
 https://webscte.co.in/
 https://en.wikipedia.org/wiki/
 https://openlibrary.org/
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Applied Physics for Sem-I (Theory)

Reviewed and prepared by Syllabus-Sub-committee, on the basis of recommendation of AICTE

Sem –I (Theory)

Course Code	:	BS103
Course Title	:	Applied Physics-I
Number of credits	:	3 (L: 2, T: 1, P: 0)
Prerequisites	:	High School Level Physics
Course Category	:	BS

Course Content:

Unit 1: Physical world, Units and Measurements

Physical quantities; fundamental and derived, Units and systems of units (CGS and SI units),

Dimensions and dimensional formulae of physical quantities, Principle of homogeneity of dimensions, Dimensional equations and their applications (conversion from one system of units to other, checking of dimensional equations and derivation of simple equations), Limitations of dimensional analysis.

Measurements: Need, measuring instruments, least count, types of Measurement (direct, indirect), Errors in Measurements (systematic and random), absolute error, relative error, error propagation, error estimation and significant figures.

Unit 2: Force and Motion

Force, Momentum, Conservation of linear momentum, its applications such as recoil of gun, numerical problems rockets (concept only), Impulse and impulsive force.

Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time period, relation between linear and angular velocity, linear acceleration and angular acceleration (related numerical), concept of Centripetal and centrifugal forces with examples (No derivation, only formula) banking of roads and bending of cyclist,concept and formula and numerical problems.

Unit 3: Work, Power and Energy

Work: Concept and units, examples of zero work, positive and negative work

Friction: concept, types, laws of limiting friction, coefficient of friction, reducing friction and its engineering applications, Work done in moving an object on rough inclined plane.

Energy and its units, kinetic energy and potential energy, Conservation of mechanical energy for freely falling bodies(simple numerical problems), transformation of energy (examples only).

Power and its units, power and work relationship, calculation of power (numerical problems).

Unit 4: Rotational Motion

Translational and rotational motion with examples, Definition of torque and angular momentum and their relation, Conservation of angular momentum (quantitative) and its applications.

Moment of inertia and its physical significance, radius of gyration for rigid body, Theorems of parallel and perpendicular axes (statements only), Moment of inertia of rod, disc, ring and sphere (hollow and solid); (Formulae only). Simple numerical problems.

Unit 5: properties of Matter

Elasticity: definition of stress and strain, moduli of elasticity, Hooke's law, significance of stress-strain curve.

Surface tension: Concept, units, cohesive **and adhesive forces**, angle of contact, Capillary rise (formula only), applications of surface tension, effect of temperature and impurity on surface tension.

Viscosity and coefficient of viscosity: terminal velocity, Stoke's law and effect of temperature on viscosity.

Hydrodynamics: Fluid motion, stream line and turbulent flow, Reynol**d**'s number Equation of continuity, Bernoulli's Theorem (only formula and numericals) and its applications (mention name only).

Unit 6: Heat and Thermometry

Concept of heat and temperature, basic concepts of measurements of heat and temperature, modes of heats transfer (conduction, convection and radiation with examples), Co-efficient of thermal conductivity simple numerical problems.

Expansion of solids, liquids and gases, coefficient of linear, surface and cubical expansions of solids and relation amongst them, specific heats Cp & Cv of a gas and their relationship (Mention only).

References:

1. Text Book of Physics for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi
2. Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi.
3. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
4. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi
5. Engineering Physics by DK Bhattacharya & Poonam Tandan; Oxford University Press, New Delhi
6. Comprehensive Practical Physics, Vol,I & II, JN Jaiswal, Laxmi Publications (P) Ltd., New Delhi
7. Practical Physics by C.L. Arora, S. Chand Publication.
8. Comprehensive Physics Vol,I & II.

Applied Physics for Sem-I (Lab)

Course Code	:	BS107
Course Tittle	:	Applied Physics-I Labs
Numbers of Credits	:	1 (L:0, T:0, P:2)
Prerequisites	:	NIL
Course Category	:	BS

Course Objectives:

Study of Applied Physics aims to give an understanding of physical world by observations and predictions. Concrete use of physical principles and analysis in various fields of engineering and technology is very prominence. The course aims to supplement the factual knowledge gained in the lecture by first hand manipulation of apparatus. This will develop scientific temper and help to apply the basic concepts and principles in solving engineering and technology based problems. In addition, students get necessary confidence in handling equipment and thus learn various skills in measurement.

List of Practical's/Activities(To perform minimum 8 practical's).

1. To measure the volume of the material of a given hollow cylinder, using a Vernier calipers.
2. To determine the area of cross section of a thin wire using a screw gauge.
3. To determine radius of curvature of a convex and a concave mirror/ surface using a spherometer.
4. To find the co-efficient of friction between wood and glass using a horizontal board.
5. To determine force constant of a spring using Hook's law.
6. To find the moment of inertia of a flywheel.
7. To find the viscosity of a given liquid (Glycerin) by Stoke's law
8. To find the co-efficient of linear expansion of the material of a rod.
9. To **verify** Boyle's law.
10. To determine the relative density of sand by using a sp. gr. Bottle.

Reference books:

1. Text books of Physics for Class-XI & XII (Part-I & II); N.C.E.R.T., Delhi.
2. Comprehensive Practical Physics, Vol-I & II, JN Laxmi Publications (P) Ltd.,
3. Practical Physics by C.L. Arora, S. Chand Publication.

Applied Chemistry

Course Code	:	BS105
Course Title	:	Applied Chemistry
Number of Credits	:	3 (L: 2, T: 1, P: 0)
Prerequisites	:	High School Level Chemistry
Course Category	:	BS

Course Objectives:

There are numerous number materials used in fabricating and manufacturing devices for the comfort of life. The selection, characterization and suitability assessment of natural raw materials essentially requires principles and concepts of Applied Chemistry for technicians. On successful completion of this course content will enable technicians to understand, ascertain and analyse and properties of natural raw materials require for producing economical and eco-friendly finished products.

- Solve various engineering problems applying the basic knowledge of atomic structure and chemical bonding.
- Use relevant water treatment method to solve domestic and industrial problems.
- Solve the engineering problems using knowledge of engineering materials and properties.
- Use relevant fuel and lubricants for domestic and industrial applications
- Solve the engineering problems using concept of Electrochemistry and corrosion.

Instruction on question setting:

- Question paper contains three groups A, B and C. Unit 1 and unit 2 are included in group A, unit 3 and unit 4 in group B, unit 5 in group C.
- 20 (twenty) number of questions are of objective types consisting of all groups, each carrying 1 (one) mark.
- 5 (five) questions are to be answered taking at least one from each group (each question carries 8 marks).

Course Content:

- **Unit 1: Atomic Structure, Chemical Bonding and Solutions**

  Rutherford model of atom, Bohr's theory (expression of energy and radius to be omitted), and hydrogen spectrum explanation based on Bohr's model of atom, Heisenberg uncertainty principle, Quantum numbers - orbital concept. Shapes of s, p and d orbitals Pauli's exclusion principle, Hund's rule of maximum multiplicity Aufbau rule, electronic configuration.

  Type of chemical bonding: ionic, covalent, metallic and hydrogen bonds. Example of each type. Hybridization, sp^3, sp^2, sp, example: $BeCl_2$, BF_3, CH_4, NH_3, H_2O; structure of diamond, graphite.
  Solution - idea of solute, solvent and solution, methods to express the concentration of solution-molarity (M = mole per liter), ppm, mass percentage, volume percentage and mole fraction.

- **Unit 2: Water**

  Graphical presentation of water distribution on Earth (pie or bar diagram). Classification of soft and hard water based on soap test, salts causing water hardness, unit of hardness and simple numerical on water hardness.

  Cause of poor lathering of soap in hard water, problems caused by the use of hard water in boiler (scale and sludge, foaming and priming, corrosion etc), and quantitative measurement of water hardness by ETDA method, total dissolved solids (TDS) alkalinity estimation.

  1) Water softening techniques - soda lime process, zeolite process and ion exchange process.
  2) Municipal water treatment (in brief only) - sedimentation, coagulation, filtration, sterilization.

  Water for human consumption for drinking and cooking purposes from any water sources and enlist Indian standard specification of drinking water (collect data and understand standards).

- **Unit 3: Engineering Materials**

Natural occurrence of metals - minerals, ores of iron, aluminium and copper, gangue (matrix), flux, slag, metallurgy - brief account of general principles of metallurgy. Extraction of iron from haematite ore using blast furnace, aluminium from bauxite along with reactions, reactions during copper extraction. Alloys – definition, purposes of alloying, ferrous alloys and non-ferrous with suitable examples, properties and applications.

General chemical composition, composition based applications (elementary idea only details omitted):

Port land cement and hardening, Glasses Refractory and Composite materials.

Polymers - monomer, homo and co polymers, degree of polymerization, simple reactions involved in preparation and their application of thermoplastics and thermosetting plastics (using PVC, PS, PTFE, nylon - 6, nylon - 66, Bakelite only), rubber and vulcanization of rubber.

- **Unit 4: Chemistry of Fuels and Lubricants**

Definition of fuel and combustion of fuel, classification of fuels, calorific values (HCV and LCV), calculation of HCV and LCV using Dulong's formula.

Proximate analysis and ultimate analysis of coal solid fuel

petrol and diesel - fuel rating (octane and cetane numbers),

Chemical composition, calorific values and applications of LPG, CNG, water gas, coal gas, producer gas and biogas.

Lubrication - function and characteristic properties of good lubricant, classification with examples, lubrication mechanism - hydrodynamic and boundary lubrication, physical properties (viscosity and viscosity index, oiliness, flash and fire point, could and pour point only) and chemical properties (coke number, total acid number saponification value) of lubricants.

- **Unit 5: Electro Chemistry**

Electronic concept of oxidation, reduction and redox reactions.

Definition of terms: electrolytes, non-electrolytes with suitable examples, Faradays laws of electrolysis and simple numerical problems.

Elementary concept of pH and buffer.

Industrial Application of Electrolysis –
- Electrometallurgy
- Electroplating
- Electrolytic refining.

Application of redox reactions in electrochemical cells –
- Primary cells - dry cell,
- Secondary cell - commercially used lead storage battery, fuel and Solar cells.

Introduction to Corrosion of metals –
- definition, types of corrosion (chemical and electrochemical), H_2 liberation and O_2 absorption mechanism of electrochemical corrosion, factors affecting rate of corrosion.

Internal corrosion preventive measures –
- Purification, alloying and heat treatment and

External corrosion preventive measures: a) metal (anodic, cathodic) coatings, b) organic inhibitors.

Applied Chemistry

Suggested Sessional work:

- **Unit 1: Atomic Structure, Chemical Bonding and Solutions**

  Assignments: Writing electronic configuration of elements up to atomic number 30 (Z= 30). Numerical on molarity, ppm, mass percentage, volume percentage and mole fraction of given solution.

  Seminar: 1. Quantum numbers,

  2. Discuss the metallic properties such as malleability, ductility, hardness, high melting point, conductance of heat and electricity, magnetic properties of metals.

  Projects: Model of molecules $BeCl_2$, BF_3, CH_4, NH_3, H_2O

- **Unit 2: Water**

  Assignments: Simple problems on hardness calculation.

  Seminar: 1. Quality and quantity requirement of water in house and industry.

  2. Quality of control measures of effluents (BOD & COD).

  Projects: Collect water samples from different water sources and measure of hardness of water.

- **Unit 3: Engineering Materials**

  Assignments: Preparation of table showing different ores of iron, copper and aluminium metals along with their chemical compositions and classify in to oxide sulphide halide ores.

  Seminar: Discuss the chemical reactions taking place in Blast Furnace in extraction of iron; Reactions occurring during extraction of copper and aluminium metals.

  Projects: Make table showing place of availability of different ores in India and show places on India map.

- **Unit 4: Chemistry of Fuels and Lubricants**

  Assignments: Calculation of HCV and LCV of fuel using fuel composition in Dulong's formula.

  Seminar: Chemical structure of fuel components influence on fuel rating.

  Projects: Mapping of energy recourses in India. Collection of data of various lubricants available in the market.

- **Unit 5: Electro Chemistry**

  Assignments: Simple problems on Faradays laws of electrolysis.

  Seminar: 1. Corrosion rate and units.

  2. Corrosion preventions.

  Projects: Mapping of area in India prone to corrosion. Collection of data of various electrochemical cells batteries used in equipment and devices and available in market. Visit to sites such as Railway station to watch corrosion area in railways and research establishment in and around the institution.

References/Suggested Learning Resources:
(a) Books:

1) Text Book of Chemistry for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi, 2017-18.
2) Agarwal, & Shikha, Engineering Chemistry, Cambridge University Press; New Delhi, 2015.
3) C.N. R. Rao, Understanding Chemistry, Universities Press (India) Pvt. Ltd., 2011.
4) S. S. Dara & S.S.Umare, Engineering Chemistry, S. Chand. Publication, New Delhi, New Delhi, 2015.
5) Jain & Jain, Engineering Chemistry, Dhanpat Rai and Sons; New Delhi, 2015.
6) S. Vairam, Engineering Chemistry, Wiley India Pvt.Ltd., New Delhi, 2013.
7) G. H. Hugar & A. N. Pathak, Applied Chemistry Laboratory Practices, Vol. l and Vol. II, NITTTR, Chandigarh, Publications, 2013-14.
8) Rajesh Agnihotri, Chemistry for Engineers, Wiley India Pvt.Ltd., 2014.

(b) Open source software and website address:

1) www.chemguide.co.uk/atommenu.html (Atomic structure and chemical bonding)
2) www.visionlearning.com (Atomic structure and chemical bonding)
3) wwwcheml.com (Atomic structure and chemical bonding)
4) https://www.wastewaterelearning.com/elearning/ (Water Treatment)
5) www.capital-refractories.com (Metals, Alloys, Cement, and Refractory Materials)
6) www.em-ea.org/guide%20books/book-2/2.1%20fuels%20and%20combustion.pdf (Fuel and Combustion)
7) www.chemcollective.org (Metals, Alloys)
8) www.wqa.org(Water Treatment)

Applied Chemistry Lab

Course Code	:	BS109
Course Title	:	Applied Chemistry Lab
Number of Credits	:	1 (L: 0, T: 0, P: 2)
Prerequisites	:	NIL
Course Category	:	BS

Course Objectives:
There are numerous number of materials used in fabricating and manufacturing devices for the comfort of life. The selection, characterization and suitability assessment of natural raw materials essentially requires principles and concepts of Applied Chemistry for technicians. The course aims to supplement the factual knowledge gained in the lectures by first hand manipulation of processes and apparatus. This will develop scientific temper and help to apply the basic concepts and principles in solving engineering problems.

LIST OF PRACTICALS:

Perform any 12 (twelve) Laboratory Practicals:
Volumetric and Gravimetric analysis.

1. Preparation of standard oxalic acid and standard potassium dichromate solution.
2. To determine strength of given sodium hydroxide solution by titrating against standard oxalic acid solution and phenolphthalein as indicator.
3. Standardization of potassium permanganate solution using standard oxalic acid and determination of percentage of iron present in given Hematite ore by $KMnO_4$ solution
4. a) Standardization of sodium thiosulphate using standard potassium dichromate solution by IODOMETRY.

b) Iodometric estimation of copper in copper pyrite ore.
5. Volumetric estimation of total acid number (TAN) of given oil.
6. Volumetric estimation of
   a. Total hardness of given water sample using standard EDTA solution.
   b. Alkalinity of given water sample using 0.01N sulphuric acid.
7. Proximate analysis of coal
   a. Gravimetric estimation moisture in given coal sample.
   b. Gravimetric estimation ash in given coal sample

Instrumental analysis

8. Determine the conductivity of given water sample.
9. Determination of the Iron content in given cement sample using colorimeter.
10. Determination of viscosity of lubricating oil using Redwood viscometer.
11. Determination of flash and fire point of lubricating oil using Able's flash point apparatus.
12. To verify the first law of electrolysis of copper sulfate using copper electrode.
13. Construction and measurement of emf of electrochemical cell (Daniel cell).
14. To study the effect of dissimilar metal combination on cell emf.
15. To apply thin layer chromatography for separation of mixture of inorganic/organic compounds.
16. Qualitative detection of ARSENIC in a given sample of water (~5 ppm solution of sodium arsenite)
17. Determination of dissolved oxygen in a sample of water.
18. Determination of pH value of unknown solution.

Reference book
VOGELS INORGANIC QUANTITATIVE ANALYSIS.

Members present in Syllabus Committee:
1. **Dr. Ujjval Kumar Bhattacharyya** (convener, lecturer, North Calcutta Polytechnic).

2. **Dr. Gandhi Kumar Kar** (Professor and head of the Dept. of Chemistry, Presidency University, Kolkata)

3. **Dr. Shyamal Kumar Chattopadhyay** (Professor IIEST, Shibpur).

4. **Dr. Mrinal Kanti Bain**, lecturer, Calcutta Technical School.

5. **Dr. Dipankar Maity**, lecturer, Birla Institute of Technology.

6. **Dr. Ranjal Paul**, Sr. Manager, Sun Pharmaceuticals Baroda.

7. **Prolay Roy,** lecturer, Memari Government Polytechnic.

Syllabus of Communication Skills in English

{The syllabus for the subject has been prepared by the Syllabus Sub-committee for the subject "Communication Skills in English" in accordance with the following instructions / directions received from Mr. B. Samanta (WBSCTVESD) vide his mail dated Dec. 6, 2019 at 12.04 PM}:-

"A meeting was held on 31.10.2019 at the Council. In the meeting following decisions were taken by the Council
1. It was decided unanimously to adopt the curriculum structure of the AICTE model syllabus 2019(attached) for all diploma courses of WBSCTVESD.
2. New curriculum structure and syllabus of diploma courses shall be prepared as per AICTE model Syllabus 2019 and implemented from the next academic session i.e. 2020-21 in phase manner.
3. Content of the syllabus of diploma courses shall be customized as per the requirement and as per the advice of the syllabus sub- committee."

Sl. No.	Code No.	Course Title	Hours per week (Total-4)			Semester	Credits
			Lecture	Tutorial	Practical		
1	HS 101	Communication Skills in English	2	0	0	1	2
2	HS105	Communication Skills in English - Lab	0	0	2	1	1
Total number of weeks – 17 (seventeen)							

Preamble:

Engineering is a service, and therefore it exists to meet human needs. Needs are communicated through language. No engineer, no matter how brilliant, can do a good job if she or he does not know what the job is for, who they are serving, for what purpose, and what needs to be done to render this service. Feedback also has to be communicated in language: figures are not enough without explanation. Communication, spoken or written, is thus essential for any service provider to do their job.

However, in most cases the courses and syllabi offered to STEM undergraduates do not adequately address the need to make them good communicators. It is often assumed that this question has been addressed by schooling, or they attempt to adapt liberal arts courses to the needs of STEM workers, thereby failing to address those needs. In a country such as India where language learning in general and English learning in particular tend to be neglected or mis-taught, this problem is compounded. To be successful, communicative language learning has to be a two way process, with communication between the teacher and student, and between students. However, the culture of student passivity in the classroom which prevails in India is poor soil for these skills to take root.

We have therefore attempted in this course to produce a system that allows, (within the known constraints) even in a limited form, for project work and conversations, collaboration and role-play, to mitigate the 'keep quiet' culture of the Indian classroom and to encourage young people to find their voices. Polytechnic, College and university students are just one small step away from becoming young professionals, and once they take that step their livelihoods (and also the safety and happiness of their clients) will depend upon how well they can ask and answer questions in the real world.

Without adequate practice, confidence-building and positive reinforcement, the practice of teaching them the pedantic small points of the rules of English grammar, or obsessing over their pronunciation, only serves to silence them further. What they need is an environment where they can communicate with each other and then troubleshoot the results, go over bad communication and make it better, identify their mistakes and correct them without being terrorised by cultural stereotypes. Graduate education should be a safe space for them to do this before work in the real world attaches real penalties to the results of bad communication. With this syllabus and attached guidelines, we have tried to take a small step in the right direction.

Course Title: **Communication Skills in English**

Course Code No.: **HS101**

Hours per week: **02 (Lecture), Total contact hours / week: 02**

Credits: **02**

Course Objectives (AICTE): Communication skills play an important role in career development. This course aims at introducing basic concepts of communication skills with an emphasis on developing personality of the students. Thus the main objectives of this course are:

- To develop confidence in speaking English with correct pronunciation
- To develop communication skills of the students i.e. listening, speaking, reading and writing skills
- To introduce the need for personality development – Focus will be on developing certain qualities which will aid students in handling personal and career challenges, leadership skills etc.

Course Content (Theory)
Unit – 1 Communiucation: Theory and Practice

- Basics of communication: Introduction, meaning and definition, process of communication etc.
- Types of communication: formal and informal, verbal, non-verbal and written. Barriers to effective communication
- 7 Cs for effective communication (considerate, concrete, concise, clear, complete, correct, courteous).
- Art of Effective communication,

- o Choosing words
- o Voice
- o Modulation
- o Clarity
- o Time
- o Simplification of words

- Technical Communication

Unit – 2 Soft Skills for Professional Excellence

- Introduction: Soft Skills and Hard Skills.
- Importance of Soft Skills.
- Life skills: Self-awareness and Self-analysis, adaptability, social skills, emotional intelligence, Interpersonal relationship and empathy etc.
- Applying soft skills across cultures – Corporate work culture, Work persona, Professionalism, Time Management
- Case Studies

Unit – 3: Reading Comprehension

Note Taking, Comprehension, vocabulary enhancement and grammar exercises based on reading of texts.

Unit – 4: Professional Writing

The art of writing Report and Memo
CVs
Letters: Job Application and Business
Drafting e-mail, minutes of a meeting, etc

Unit – 5: Vocabulary and Grammar

Remedial Grammar and Exercises
Professional Workplace Communication
Parts of speech, active and passive voice, tenses etc.

Course outcomes (AICTE):
At the end of this course, the participants will:

- Develop basic speaking and writing skills including proper usage of language and vocabulary so that they can become highly confident and skilled speakers and writers.
- Be informed of the latest trends in basic verbal activities such as presentations, facing interviews and other forms of oral communication.
- Also develop skills of group presentation and communication in team.
- Develop non-verbal communication such as proper use of body language and gestures

Course Title: **Communication Skills in English - Lab**

Course Code No.: **HS105**

Hours per week: **02 (Practical), Total contact hours / week: 02**

Credits: **01**

Course Objectives (AICTE):

Communication skills play an important role in career development. This course aims at introducing basic concepts of communication skills with an emphasis on developing personality of the students. Thus the main objectives of this course are:

1. To develop listening skills for enhancing communication.
2. To develop speaking skills with a focus on correct pronunciation and fluency.
3. To introduce the need for Personality development – Focus will be on developing certain qualities which will aid students in handling personal and career challenges, leadership skills, etc. for that purpose group discussion, extempore and other activities should be conducted during lab classes.

Course Content:

Unit – 1:
Basic Common Communication Problems and their Solutions

Unit – 2:
Introduction to Phonetics
Sounds: consonant, vowel. Transcription of words (IPA), weak forms etc.

Unit – 3:
Speaking and Listening Skills
Standard and Formal Speech: Oral presentations, Group Discussions, Public Speaking, Business presentations etc. Conversation practice and role playing, Job interviews, Note taking etc.

Unit – 4:
Non-verbal Communication
Proxemics, Haptics and Kinesics

Members of the Syllabus Sub-committee for *Communication Skills in English:-*

1. Prof. Rimi B. Chatterjee (Expert),
   Professor, Department of English, Jadavpur University and former Professor of English at IIT, Kharagpur, West Bengal.
   (Prof. Chatterjee, the subject expert, has wide ranging experience in teaching Communication Skills in English to Engineering students, both in IIT, Kanpur and Jadavpur University).
2. Ms. Purna Biswas (Member), Lecturer in Humanities, EIJE, Dalalpukur, Howrah
3. Mr. Santanu Mitra (Member), Lecturer in Humanities, Women's Polytechnic, Kolkata
4. Mr. Hemadri Chatterjee (Convener), Lecturer in Humanities, Ramakrishna Mission Shilpapitha, Belgharia, Kolkata

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Proposed Syllabus for Engineering Graphics

Name of the Course :	Engineering Graphics	
Course Code :	Semester : First	
Duration : 17 Weeks	Maximum Marks :	: 100
Lecture : Nil	Assignment	: 20
	Class Performance	: 20
Tutorial : Nil	Viva Voce	: 10
	Attendance	: 10
Practical : 3 hrs./week	External (Viva, Sketch Book & Drawing Sheet)	: 40
Credit : 1.5		

Aim :
1. The Course is aimed to develop the basic graphic skills so that the students can prepare Engineering Drawing in their practical field.
2. Understand the fundamentals of Engineering Graphics.
3. Read and interpret object drawing.
4. To develop the skills of Computer Aided Drafting and can easily cope up the skill of drafting for modern drawing offices/industries.

Objectives :
1. To develop sense of Scale and drawing technique of different curves and their application.
2. To develop drafting and sketching skills, to know the applications of drawing equipment and get familiarize with Indian Standards related to engineering drawing.
3. To develop concept of Orthographic Projection and to draw Orthographic Views for different objects.
4. To visualize three dimensional objects from Orthographic Views and to draw isometric views/projections.
5. To be familiar with AutoCAD and to develop the skill of drafting in AutoCAD by using different commands.

Pre-requisites :
1. Unambiguous and clear visualization.
2. Sound Pictorial Intelligence.

Unit No.	Contents	
Unit 1	1.1 Letters and numerals (Single Stroke Vertical) 1.2 Conventions of lines and their applications 1.3 Concept of Representative Fraction (R.F), Reduced scale, Enlarged scale & Full Scale, Engineering Scale such as Plain Scale & Diagonal Scale. 1.4 Dimensional Techniques - Unidirectional System and Aligned System.	

Unit 2	2.1 Geometrical Construction :
	  a)Draw Regular Polygons, Ellipse, Parabola, hyperbola
	  b) Draw Curve passing through given no. of points, cycloid, involute of a circle and polygon	

Unit 3	3.1 Introduction to Orthographic Projection : Concept of First Angle & Third Angle of projection. Projections of lines(limited to both ends in 1st quadrant) : parallel to the reference planes, inclined to the reference planes (1st Angle Method) 3.2 Projections of solid body: Regular Polygonal Pyramid, Cylinder, Cone - inclined to only one reference plane (1st Angle Method)	

Unit 4	4.1 Conversion of Pictorial Views into orthographic views (Simple Objects &First Angle Projection Method Only)
Unit 5	5.1 Introduction to Isometric Projections, Concept of Isometric Scale and Isometric Views 5.2 Conversion of Orthographic views into Isometric Views/Projections : Simple Objects e.g. regular prism, pyramid, cone, cylinder.
Unit 6	6.1 Free hand sketches of engineering elements such as thread profile, nuts, bolts, studs, set screws, washers, locking arrangements etc. and their conventional representation (For branches other than Mechanical Engineering, the teachers should select branch specific elements for free hand sketching)

Unit 7	7.1 Introduction to different commands and toolbars of AutoCAD
	    a) Draw command : Lines, Circle, Polygon, Arc, Ellipse, Polyline, Fillet, Chamfer, Hatch, Array (Rectangular & Polar) etc.
	    b) Modify Command : Offset, Trim, Extend, Erase, Fillet, Chamfer, Break, Lengthen, Copy, Move, Mirror, Stretch, Match Properties, Pedit etc.
	    c) View : Zoom All, Zoom Window, Zoom Extent etc.
	    d) Dimensioning : Dimension Setting, Linear, Aligned, Radial, Diameter, Leader, Angular etc.
	    c) Text : Text Style, Dtext, Mtext, DDedit etc.
	    d) Format : Limits, Layers, Pan etc.
	7.2 Making a few simple 2D drawings in AutoCAD.

Sl. No.	Practical Exercise	Unit No.	Hrs.
1	Draw horizontal, vertical, 30˚, 45˚, 60˚, 75˚, different types of lines, dimensioning styles using Tee and Set Squares / Drafters. (Do this exercise in Sketch Book)	1	02
2	Write single stroke vertical alphabets and numerical (7:4 ratio) (Do this exercise in Sketch Book)	1	02
3	Draw regular geometric constructions and redraw/copy the given figure (Do this exercise in Sketch Book)	1	02
4	Draw at least two problems on plain scale and two problems on diagonal scales (Do this exercise in Sketch Book)	1	03
5	Draw problems on ellipse, parabola, involute and cycloid (Do this exercise in Sketch Book)	2	06
6	Draw at least two problems on lines and two problems on solid (First Angle Projection method) (Do this exercise in A2 size drawing sheet)	3	09
7	Plan, Elevation and Side View of at least two pictorial views to be drawn on one A2 size Drawing Sheet along with dimensions	4	06
8	At least Two Isometric Views and two Isometric Projections to be drawn on one A2 size Drawing Sheet	5	06

9	Draw free hand sketches / conventional representation of machine elements such as thread profile, nuts, bolts, studs, set screws, washers, locking arrangements etc.	6	03
10	Simple geometrical figures such as triangle, rectangle, polygon, circle, ellipse, and simple orthographic views of brackets, gaskets etc. to be drawn in AutoCAD and Printout to be taken on A4 size Sheet. At least two sheets to be prepared.	7	12
		Total Period	51

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
N.D.Bhatt	Engineering Drawing	53rd Edition	Charotkar Publishing House
R.K.Dhawan	Engineering Drawing	Revised Edition 2015	S.Chand & Co.
K. Venugopal & V. Prabhuraja Raja	Engineering Drawing and Graphics + AutoCAD		New Age Publication

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
S.N. Lal	Engineering Drawing		CENGAGE
Basant Agrawal & C M Agrwal	Engineering Drawing		Tata McGrew Hill
Dhananjay A Jolhe	Engineering Drawing with an Introduction to AutoCAD		Tata McGrew Hill
S.P.Dey	AutoCAD 2014		Vikas Publisher
P.S. Gill	Engineering Drawing		S.K.Kataria & Sons.

References :

1.Engineering Graphics Syllabus of AICTE Model Curriculum 2019.

2. Syllabus of Technical Drawing (Old) of W.B.S.C.T.E

Engineering Workshop Practice

Course Code	:	
Course Title	:	Engineering Workshop Practice
Number of Credits	:	3(L-0, T-0, P-3)
Prerequisites	:	
Course Category	:	Engineering Science
Semester	:	First

COMPETENCY

The Engineering Workshop Practice Course should be taught and implemented with the aim to develop the following Course Outcomes (COs) so that the students will be able to prepare simple jobs on the shop floor of the engineering workshop.

COURSE OUTCOMES

The theory and practical experiences associated with the course, the students will gain the following industry oriented COs:

➢ Read and interpret job drawings
➢ Select tools, equipment and machineries according to the job.
➢ Use the hand tools in different shops for performing different operations
➢ Prepare the job according to drawing
➢ Adopt safe working practice.
➢ Maintenance of workshop tools, equipment and machineries.
➢ Acquaint with the specifications on all raw materials, tools and equipments used.

COURSE CONTENT

Course Content: There are 9 (nine) modules out of which 6 modules should be taught. Selection of these six modules should be in the following manner.
Module 1, 2 and 3 are compulsory and any three from rest as deemed fit for the branch and availability in the institute.

Module No. & Name	Details of Workshop Content	Hours
1. Electrical Wiring	**1. Introductory Session** • Safety precautions to be followed in Electrical Works • Electric shock, methods of shock treatment • Safety measure: Earthing, Fuse, circuit breakers, etc. • Different types of wire-gauge & strands and their applications • Different tools used in Electrical wiring works • General wiring accessories & their uses.	

	• Types of switches and their application. • Types of wiring and joints. **Practical (any three)- Group works** 1. Study/ demonstration of single phase electrical service connection from pole to house including consumer installation. 2. Study of different types of wiring and connection of Single Phase Motor (Fan). 3. Circuits for one lamp controlled by one switch by surface conduit wiring, 4. Lamp circuits- connection of lamp and socket by separate switches, Connection of Fluorescent lamp/tube light, 5. Simple lamp circuits- install bedroom lighting 6. Simple lamp circuits- install stair case wiring. 7. Wiring of calling-bell	10 hrs
2. Fitting	**1. Introductory Session** • Demonstration of different tools and equipment used in fitting shop. • Study of different precious measuring instrument such as micrometer, vernier calipers, bevel protectors. • Care and maintenance of the above mentioned tools and equipment. • Study of drilling machines and power tools used in fitting shop. • Safety measure to be followed in Fitting shop. **2. Practical/ Demonstration** • Demonstration of different fitting job operations like chipping, filing, drilling, tapping, sawing, cutting etc. **Job Preparation -Individual Works** • One simple fitting job involving practice of chipping, filing, marking, drilling, tapping, cuttingetc.	10 hrs
3. Welding	**1. Introductory Session** • Purpose of welding, advantages & disadvantages of it over other joining processes. • Types of welding processes (in brief) • Specification, usage, care & maintenance of various welding machines, tools & equipment used in the shop. • Selection of welding methods and electrodes. • Safety measures & equipment required while working in welding shop.	10 hrs

	2. Practical/ Demonstration
	• How to start an Arc & use it for Arc Welding, sustainably.
	• Demonstration of various welding m/c, tools, equipment available in the shop.
	• Demonstration of shielded metal arc welding (SMAW), Gas welding and cutting.
	• Repairing of broken metal structures using welding.
	• Defects of welding & their remedies.
	
	Job Preparation (Any One)-Individual Works
	    Job 1 – Butt Joint
	    Job 2 – Lap Joint
	    Job 3 – 'T' Joint	

4. Carpentry	**1. Introductory Session** • Raw materials used in carpentry shop: wood & alternative materials. • Specification, usage, care & maintenance of various tools, equipment and machineries used in the Carpentry shop. • Types of wood. Difference between hard and soft wood. • Timber: characteristics, usage and defects. Difference between wood and timber. • Seasoning of wood. • Different types of joints such as cross half-lap joint, through tenon and mortise joint, dove tail joints, etc. • Safety measures to be taken in carpentry shop. **2. Practical/Demonstration** • Demonstration of use of different tools, equipment and machineries. • Demonstration of different wood working processes, like plaining, marking, chiseling, grooving, turning of wood etc. Job Preparation -Individual Works One simple job involving any one joint.	10 hrs
5. Sheet Metal Working	**1. Introductory Session** • Briefing on different types of sheet metal, like Stainless Steel Sheet Metal, Copper Sheet Metal, Brass Sheet Metal, Corrugated Sheet Metal, Galvanized Sheet Metals etc., and their uses. • Demonstration of different types of Tools& machines and their use in sheet metal work.	

	• Demonstration of different types sheet metal joints and their applications. • Demonstration of different types of sheet metal working: cold working, hot working, warm working, bending, drawing, end curling, shearing, piercing, sheet metal presses, etc. • Sheet metal joining operation like welding, brazing, soldering and riveting. • Safety measure to be followed in sheet metal work. **2. Practical:** Making of any simple job(example: sheet metal mug) involving different sheet petal operations including soldering and riveting.	10 hrs
6. Smithy/Forging	**1. Introductory Session** • Purpose of Smithy / Forging Works • Different types of Hearths used for Smithy / Forging works • Specification, usage, care and maintenance of various tools and equipment used in the shop. • Types of raw materials used in Smithy / Forging shop & their required temperature for it. • Types of fuel used in hearth and the respective maximum temperature obtained. • Uses of Fire Bricks & Clays in Smithy/Forging Work Shop. • Types of heat treatment processes involved in Smithy / Forging shop and its effect on forged items. • Hot forge & cold forge utility. • Safety measures & equipment required while working in Smithy / Forging Shop **2. Practical/ Demonstration** • Practice / Demonstration of firing of hearth / Furnace, Cleaning of Clinkers and Temperature Control of Fire. • Practice / Demonstration on different basic Smithy / Forging operations such as Upsetting, Drawing down, Setting down, Necking, Cutting, Bending, Fullering, Swaging, Punching and Drifting etc. Demonstration on making of • Cube, hexagonal cube, hexagonal bar from round bar. • Hexagonal /octagonal flat chisel including tempering of edges.	10 hrs

	Job Preparation (Any one) – **group effort** by students • Job 1 Making a cold / hot flat chisel • Job 2 Simple Tong • Job 3 Production of any other utility tools/ items -e.g. Chain-links, door ring, hexagonal bolt / square shank boring tool, fan hook (long S-type) etc.	
7. Machine shop Practice	1. **Introductory Session** • Purpose of a machine shop/ workshop in industry. • Demonstration of all available tools & tackles of machine shop. • Inculcation of basic idea of machine tool; differentiation between machine & machine tool. • Familiarization of all machine tools in the machine shop. • Safety precautions for working in a machine shop. 2. **Practice in Machine Shop** • Identification of different parts of a lathe and utility of those parts. • Demonstration of all possible machining operation on a lathe, e.g. turning, facing, parting, taper turning, drilling, threading etc. • Demonstration to operate a drilling machine or shaping machine and identifying different parts of that m/c tool. Job Practice-(Individual work) Preparation of one job in Lathe, involving simple machining operations (e.g. turning, facing, grooving, threading, knurling etc.).	10 hrs
8. Electronic Shop	**1. Introductory Session** • Discussion on active and passive electronic components. • Discussion on soldering and its use. • Introduction on multi-meter and its use. • Discussion on use of test equipment in fault finding. • Discussion on resistor, capacitor, amplifiers, relay, diodes, zener diode and LEDs. • Safety measure to be followed in electronic shop. **2. Practical/ Demonstration** • Familiarization, identification and testing of active and passive components. • Soldering and de-soldering practice.	10 hrs

	• Use of Multi meter (both Analog and digital). • Demonstration of resistor, capacitor, amplifiers, relay, diodes, zener diode and LEDs.	
9. Demonstration	Following demonstration may be conducted: 1. Demonstration of measurement of Current, Voltage, Power and Energy for an electrical system/ wiring. 2. Demonstration of advanced power tools such as pneumatic tools, electrical portable grinding tools and accessories. 3. Demonstration of bourdon tube pressure gauge. 4. Demonstration of ball bearing and roller bearing. 5. Demonstration of portable power tools for Cutting and drilling, etc.	10 hrs

LEARNING OUTCOMES (LOs)

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

- Understand the basic safety measure to be followed in different works.
- Understand basic engineering processes for manufacturing and assembly.
- Understand and interpret job drawings, produce jobs, and inspect the job for specified dimensions.
- Understand the various types of wiring systems and acquire skills in electrical wiring.

References

[1] S.K. HazraChaudhary, Workshop Technology, Volume I&II, Media Promoters and Publishers, Mumbai.
[2] B.S. Raghuwanshi, Workshop Technology, Volume I&II, DhanpathRai and Sons, New Delhi 2014
[3] K. Venkat Reddy, Workshop Practice Manual, BS Publications, Hyderabad 2014
[4] Kents Mechanical Engineering Hand book, John Wiley and Sons, New York
[5] H.S. Bawa, Workshop Practice, Mcgrawhill HED
[6] R.P. Singh, Electrical Workshop: Safety, Commissioning, Maintenance & Testing of Electrical Equipment, Wiley

Teachers should use the following strategies to achieve the various outcomes of the course.

- Different methods of teaching and media to be used to attain classroom attention.
- Massive open online courses (MOOCs) may be used to teach various topics/sub topics.
- 15-20% of the topics which are relatively simpler of descriptive in nature should be given to the students for self-learning and assess the development of competency through classroom presentations.
- Micro-projects may be given to group of students for hand-on experiences
- Encouraging students to visit to sites such as Railway station and research establishment around the institution.

Learning Outcomes:

At the end of the course student will be able to

- To express quantitative measurements accurately.
- To practice and adapt good measuring techniques.
- To use various apparatus for precise measurements.
- To understand and differentiate different methods of quantitative analysis.
- To know and understand principles of quantitative analysis using instruments.
- To construct different electrochemical cells used in developing batteries.
- To understand and appreciate methods of corrosion abetments.

Reference Books:

1. Text Book of Chemistry for Class XI & XII (Part-I, Part-II); N.C.E.R.T., Delhi, 2017-18.
2. Dr. G. H. Hugar and Prof A. N. Pathak, Applied Chemistry Laboratory Practices, Vol. I and Vol. II, NITTTR, Chandigarh, Publications, 2013-14.
3. Agnihotri, Rajesh, Chemistry for Engineers, Wiley India Pvt.Ltd., 2014.
4. Jain & Jain, Engineering Chemistry, Dhanpat Rai and Sons; New Delhi, 2015.

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Course Code	:	HS103
Course Title	:	Sports and Yoga
Number of Credits	:	1(L:0,T:0,P:2)
Prerequisites	:	NIL
Course Category	:	HS

Course Objectives:
- To make the students understand the importance of sound health and fitness principles as they relate to better health.
- To expose the students to a variety of physical and yogic activities aimed at stimulating their continued inquiry about Yoga, physical education, health and fitness.
- To create a safe, progressive, methodical and efficient activity based plan to enhance improvement and minimize risk of injury.
- To develop among students an appreciation of physical activity as a lifetime pursuit and a means to better health.

Course Content:

- **Introduction to Physical Education**

  o Meaning & definition of Physical Education

  o Aims & Objectives of Physical Education

  o Changing trends in Physical Education

- **Olympic Movement**

  o Ancient & Modern Olympics (Summer & Winter)

  o Olympic Symbols, Ideals, Objectives & Values

  o Awards and Honours in the field of Sports in India (Dronacharya Award, Arjuna Award, Dhayanchand Award, Rajiv Gandhi Khel Ratna Award etc.)

- **Physical Fitness, Wellness & Lifestyle**

  o Meaning & Importance of Physical Fitness & Wellness

  o Components of Physical fitness

  o Components of Health related fitness

  o Components of wellness

  o Preventing Health Threats through Lifestyle Change

  o Concept of Positive Lifestyle

- **Fundamentals of Anatomy & Physiology in Physical Education, Sports and Yoga**

  o Define Anatomy, Physiology & Its Importance

  o Effect of exercise on the functioning of Various Body Systems. (Circulatory System, Respiratory System, Neuro-Muscular System etc.)

- **Kinesiology, Biomechanics & Sports**

  o Meaning & Importance of Kinesiology & Biomechanics in Physical Edu. & Sports

  o Newton's Law of Motion & its application in sports.

  o Friction and its effects in Sports.

- **Postures**

  o Meaning and Concept of Postures.

  o Causes of Bad Posture.

  o Advantages & disadvantages of weight training.

  o Concept & advantages of Correct Posture.

  o Common Postural Deformities – Knock Knee; Flat Foot; Round Shoulders; Lordosis, Kyphosis, Bow Legs and Scoliosis.

  o Corrective Measures for Postural Deformities

- **Yoga**

  o Meaning & Importance of Yoga

  o Elements of Yoga

  o Introduction - Asanas, Pranayama, Meditation & Yogic Kriyas

  o Yoga for concentration & related Asanas (Sukhasana; Tadasana; Padmasana & Sha-shankasana)

  o Relaxation Techniques for improving concentration - Yog-nidra

- **Yoga & Lifestyle**

  o Asanas as preventive measures.

  o Hypertension: Tadasana, Vajrasana, Pavan Muktasana, Ardha Chakrasana, Bhujangasana, Sharasana.

  o Obesity: Procedure, Benefits & contraindications for Vajrasana, Hastasana, Trikonasana, Ardh Matsyendrasana.

  o Back Pain: Tadasana, Ardh Matsyendrasana, Vakrasana, Shalabhasana, Bhujangasana.

  o Diabetes: Procedure, Benefits & contraindications for Bhujangasana, Paschimottasana, Pavan Muktasana, Ardh Matsyendrasana.

  o Asthema: Procedure, Benefits & contraindications for Sukhasana, Chakrasana, Gomukhasana, Parvatasana, Bhujangasana, Paschimottasana, Matsyasana.

- **Training and Planning in Sports**

  o Meaning of Training

  o Warming up and limbering down

  o Skill, Technique & Style

  o Meaning and Objectives of Planning.

  o Tournament – Knock-Out, League/Round Robin & Combination.

- **Psychology & Sports**

  o Definition & Importance of Psychology in Physical Edu. & Sports

  o Define & Differentiate Between Growth & Development

  o Adolescent Problems & Their Management

  o Emotion: Concept, Type & Controlling of emotions

  o Meaning, Concept & Types of Aggressions in Sports.

  o Psychological benefits of exercise.

  o Anxiety & Fear and its effects on Sports Performance.

  o Motivation, its type & techniques.

  o Understanding Stress & Coping Strategies.

- **Doping**
  - Meaning and Concept of Doping
  - Prohibited Substances & Methods
  - Side Effects of Prohibited Substances

- **Sports Medicine**
  - First Aid – Definition, Aims & Objectives.
  - Sports injuries: Classification, Causes & Prevention.
  - Management of Injuries: Soft Tissue Injuries and Bone & Joint Injuries

- **Sports / Games**

  Following sub topics related to any one Game/Sport of choice of student out of: Athletics, Badminton, Basketball, Chess, Cricket, Kabaddi, Lawn Tennis, Swimming, Table Tennis, Volleyball, Yoga etc.

  - History of the Game/Sport.
  - Latest General Rules of the Game/Sport.
  - Specifications of Play Fields and Related Sports Equipment.
  - Important Tournaments and Venues.
  - Sports Personalities.
  - Proper Sports Gear and its Importance.

References:
1. Modern Trends and Physical Education by Prof. Ajmer Singh.
2. Light On Yoga By B.K.S. Iyengar.
3. Health and Physical Education – NCERT (11th and 12th Classes)

Course Outcomes:

On successful completion of the course the students will be able to:
(i) Practice Physical activities and Hatha Yoga focusing on yoga for strength, flexibility, and relaxation.
(ii) Learn techniques for increasing concentration and decreasing anxiety which leads to stronger academic performance.
(iii) Learn breathing exercises and healthy fitness activities
(iv) Understand basic skills associated with yoga and physical activities including strength and flexibility, balance and coordination.
(v) Perform yoga movements in various combination and forms.
(vi) Assess current personal fitness levels.
(vii) Identify opportunities for participation in yoga and sports activities.
(viii) Develop understanding of health-related fitness components: cardiorespiratory endurance, flexibility and body composition etc.
(ix) Improve personal fitness through participation in sports and yogic activities.
(x) Develop understanding of psychological problems associated with the age and lifestyle.

(xi) Demonstrate an understanding of sound nutritional practices as related to health and physical performance.

(xii) Assess yoga activities in terms of fitness value.

(xiii) Identify and apply injury prevention principles related to yoga and physical fitness activities.

(xiv) Understand and correctly apply biomechanical and physiological principles elated to exercise and training.

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Course Code	:	HS105
Course Title	:	Communication Skills in English - Lab
Number of Credits	:	1 (L: 0, T: 0, P: 2)
Prerequisites	:	NIL
Course Category	:	HS

Course Objectives:
Communication skills play an important role in career development. This lab course aims at actively involving students in various activities to improve their communication skills with an emphasis on developing personality of the students. Thus, the objectives of this course are:

1. To develop listening skills for enhancing communication.

2. To develop speaking skills with a focus on correct pronunciation and fluency.

3. To introduce the need for Personality development- Focus will be on developing certain qualities which will aid students in handling personal and career challenges, leadership skills etc. for that purpose group discussion, extempore and other activities should be conducted during lab classes.

Course Content:
Unit 1 Listening Skills
Listening Process and Practice: Introduction to recorded lectures, poems, interviews and speeches, listening tests.

Unit II Introduction to Phonetics
Sounds: consonant, vowel, diphthongs, etc. transcription of words (IPA), weak forms, syllable division, word stress, intonation, voice etc.

Unit III Speaking Skills
Standard and formal speech: Group discussion, oral presentations, public speaking, business presentations etc. Conversation practice and role playing, mock interviews etc.

Unit IV Building vocabulary
Etymological study of words and construction of words, phrasal verbs, foreign phrases, idioms and phrases. Jargon/ Register related to organizational set up, word exercises and word games to enhance self-expression and vocabulary of participants.

Recommended Readings:
1. Daniel Jones. *The Pronunciation of English.* Cambridge: Cambridge University Press, 1956.

2. James Hartman& et al. Ed. *English Pronouncing Dictionary.* Cambridge: Cambridge University

West Bengal State Council of Technical Education

(A Statutory Body under West Bengal Act XXI of 1995)

Kolkata KarigoriBhavan, 2nd Floor, 110 S. N. Banerjee Road, Kolkata - 700 013.

Format for Syllabus

Name of the Course: Computer Engineering Group (**Discrete Mathematics**)	

Course Code: CST/3/301	**Semester: Third**
Duration:	**Maximum Marks:100**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Class Test : 20 Marks
Tutorial: hrs./week	Teachers Assessment: 10 Marks
Practical:	End Semester Exam.: 70 Marks
Credit: 3	

Aim:	
Sl. No.	
1.	To learn basic concept of Discrete Mathematics.

Objective:	
Sl. No.	Students will able to:
1.	· Understand relation between Mathematics and applications in Computer Science & Engineering
2.	· Acquire sufficient Mathematical techniques necessary for practical problems used in computerscience
3.	· Acquire knowledge of Mathematical term, concept, principals, and different methods.
4.	· Develop ability to apply Mathematical methods to solve technical

Pre-Requisite:	
Sl. No.	
1.	Basic Concept of Math's
2.	Calculation of Numbers
3.	Introduction to Formula

Contents (Theory)		Hrs./Unit	Marks
Unit: 1	Mathematical Logic 1.1 Statement and Notation 1.2 Connectives – Negation, Conjunction, Disjunction, Statement Formulas and truth Tables, Conditional and Biconditional, Well-formed Formulas, Tautologies, Equivalence of Formulas, Duality Law, Tautological Implications 1.3 Normal Forms – Disjunctive and Conjunctive Normal Forms. 1.4 The Theory of Inference for the Statement Calculus – validity using Truth Table, Rules of Inference, Consistency of Premises and Indirect method of proof 1.5 Predicate Calculus : Rules of precedence of logical operators Predicate (propositional) functions	**04**	

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Unit: 2	**SET THEORY** 2.1 CONCEPT OF SETS**:** Notation – Subset – Superset – Empty set – Universal set – Examples 2.2 OPERATION ON SETS**:** Union – Intersection – Complementation – Difference – Symmetric difference – Problems relating simple set identities 2.3 Definition of power set – Cartesian product of finite number of sets – Simple problems 2.4 Cardinality of a set 2.5 Finite and infinite sets	**07**	
Unit: 3	3.1 RELATION BETWEEN TWO SETS**:** Binary relation as a subset of Cartesian product 3.2 Reflexive, symmetric & transitive relations – Examples 3.3 Equivalence relation – Examples 3.4 Partition – problems	**04**	
Unit: 4	4.1 FUNCTIONS**:** Definition of function – Domain, Co-domain & Range of a function 4.2 Injective, Surjective and Bijective functions – Related problems	**03**	
Unit: 5	**MATRIX THEORY** **5.1** ELEMENTARY TRANSFORMATION ON A MATRIX**:** Equivalent matrices – Definition of sub-matrix of a matrix – Rank of a matrix (definition) – Echelon form of a matrix – Theorems on rank (statement only) – Evaluation of rank of a matrix – Problems 5.2 ADJOINT of a square matrix – Definition of INVERSE of a matrix – Uniqueness of the inverse – Theorems on inverse of matrices – Problems 5.3 System of SIMULTANEOUS LINEAR EQUATIONS – Test of consistency; Solution of n Linear Equations in n unknowns – Problem, Solution of m Linear equations in n unknowns with m<n and m>n – Problems. 5.4 Definition of Eigenvalues and Eigenvectors;Characteristic values and Characteristic vectors of a Matrix; Characteristic equation – relation between Characteristic Roots and Characteristic Vectors, Nature of Characteristic Roots of special type of Matrices– The Process of finding the Eigenvalues and Eigenvectors –Theorems and Related problems.	10	
Unit: 6	**COUNTING TECHNIQUES** 6.1 PRINCIPLE OF INCLUSION AND EXCLUSION**:** Statement of the principle – Set theoretic problems relating to principles of inclusion and exclusion 6.2 MATHEMATICAL INDUCTION**:** Concept of Induction – Statement of the principle of Mathematical Induction – Application of the principle of Induction in various problems 6.3 RECURRENCE RELATION**:** Definition – Examples	06	

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	(Fibonacci series etc.) – Linear recurrence relations with constants coefficients – Homogeneous solutions – Particular solutions – Total solutions – Problems		
Unit: 7	**GRAPH THEORY** 7.1 Introduction – Definition of a graph –Directed & Undirected graphs(Definition & Example); Basic Terminology – Loop, Multigraph,Pseudograph,Simplegraph,Finite and Infinite graphs- Definition and examples; 7.2 Subgraph Spanning subgraph-Removal of a Vertex and an edge-Induced subgraph- Definition &Example; 7.3 Graph Isomorphism – Definition and Examples; 7.4 Walk, Paths, length and Circuits –Definition and Examples; 7.5 Euler graphs –Euler path, Euler Circuit – Definition and examples; 7.6 Hamiltonian Graphs – Definition and example – Problems 7.7 Sequential Representation of Graphs 7.8 Linked Representation of Graphs 7.9 Traversal of Graphs 7.8 Shortest Path, Shortest path algorithm – Dijkstra's algorithm, Floyd-Warshall algorithms – Problems. BFS algorithm-DFS 7.9 Application of Graph	08	
Unit: 8	**TREE:** 8.1 Definition & properties of trees – Distance & centre in a tree ; 8.2 Rooted tree- Co Tree-definition & example; 8.3 Binary trees –Definition & Properties, Path length, Binary tree representation of general trees-Problems, Traversal. 8.4 Spanning tree – Branch of tree- chord- definition & properties; Spanning tree in a weighted graph 8.5 Algorithm for constructing Spanning tree – Graph theoretic algorithms – Minimal Spanning tree algorithm – Kruskal's Algorithm -Problems	**06**	
Total		**48**	

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
J.P Tremblay R. Manohar	Discrete Mathematical Structures with Applications to Computer Science		McGraw Hill
Swapan Kumar Chakraborty&BikashKanti Sarkar	Discrete Mathematics		OXFORD

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T. Sengadir	Discrete Mathematics and Combinatorics		PEARSON
Lipschutz& Lipson	Discrete Mathematics		McGraw Hill
Iyengear	Discrete Mathematics		Vikas
Purna Chandra Biswal	Discrete Mathematics and Graph Theory		PHI
Veerarajan	Discrete Mathematics		McGrawHill
Geetha	Discrete Mathematics		Scitech

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
R Akerkar& R Akerkar	Discrete Mathematics		PEARSON
Lipschutz& Lipson	Discrete Mathematics (Solved Problems Series)		McGraw Hill
G.Suresh Singh	Graph Theory		PHI
Dr.SukhenduDey	Graph Theory with Application		SPD

Suggested list of Assignments / Tutorial:

Sl. No.	Topic on which tutorial is to be conducted
1.	Analyze designed algorithm
2.	Study of dynamic & static Memory allocation
3.	Explain linear, non-linear data structure

Note:

Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

Name of the Course : Programming in C	
Course Code: CST/3/302	**Semester: Third**
Duration: Six Months	**Maximum Marks: 150**
Teaching Scheme:	**Examination Scheme:**
Practical: 3 hrs./week	Class Test : 20 Marks

Theory: 3 hrs./week	Teachers Assessment: 10 Marks
Credit : 3+2	End Semester Exam. : 70 Marks
	Practical / Sessional : 25 (Internal) + 25 (External)

Aim of the Course:	
S. No	Aims about
1.	To study the structure programming concept.
2.	To study Linear Data Structure.
3.	To study Looping and Branching.
4.	To study subscripted variables and user defined data types.
5.	To study user defined functions.
6.	To study pointers in depth.
7.	To study formatted and unformatted files.

Objective of the course:	
S. No	The students will be able to -
1.	Describe the concepts of constants, variables, data types and operators.
2.	Develop programs using input and output operations.
3.	Write programs using different looping and branching statements.
4.	Write programs based on arrays and strings handling functions.
5.	Write programs using user-defined functions, structures and union.
6.	Write programs using C pointers.
7.	Use formatted and unformatted files to store and access data.

Pre-Requisites -	
S. No	
1.	Interaction with DOS / Windows Operating System.
2.	Ability to develop logic / flow of simple problem.

Unit No.	Contents	Hrs/Unit	Marks
1	**Basics of C** 1.1 History of C, Advantages of Structured Program, Files (source, header, object, binary executable) used in C, Characteristics of C. 1.2 C character set, Tokens, Constants, Variables, Keywords, Data types used in C. 1.3 C operators (arithmetic, logical, assignment, relational, unary, binary, increment and decrement, conditional, bit wise, special, comma, sizeof, postfix, prefix etc.), Operator precedence, Associativity of operators, Type conversion, Typecasting. 1.4 Formatted input, Formatted output.	4	
2	**Decision Control and Looping Statements** 2.1 Decision making and branching statements, if statement (if, if-else, else-if ladder, nested if-else), Switch case statement. 2.2 Iterative/Loop statement, Entry controlled & exit controlled loop structure & differences, while, do-while, and for loop structure, Break and continue statement, Conditional and unconditional Goto statement, nested loop structure.	4	
Unit No.	Contents		Marks
3	**Arrays and Strings**	6	

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Unit No.	Contents	Hrs/Unit	Marks
	3.1. Advantages of subscripted variables/ arrays, Declaration and initialization of one dimensional, two dimensional and character arrays, Accessing array elements. 3.2. Declaration and initialization of string variables, String handling functions from standard library (strlen (), strcpy (), strcat (), strcmp ()), String operations to extract substring from left, right, middle of a string, Replacement of string characters, Concatenation of two strings.		
4	**Functions** 4.1 Functions, Need of functions, Prototype declaration, Scope and lifetime of variables, Defining functions, Passing parameter types, Function call (call by value, call by reference), Return values. 4.2 **Storage classes**, Category of function (No argument No return value, No argument with return value, Argument with return value), Recursion and use of memory stack, Types of recursion.	10	
5	**Pointers** 5.1. Understanding pointers, Declaring and accessing pointers, Null Pointers, Generic Pointers, Pointers arithmetic and expressions. 5.2. Passing arguments to function using pointers, Pointers and arrays, Passing an array to a function, Array name and Pointer. 5.3. Pointers and Strings, Array of pointers, Function pointers, Pointers to pointers. 5.4 Memory usage, Dynamic memory allocation, Drawbacks of pointer.	10	
6	**Structures, Union and Enumerated Data types** 6.1 Structures, Defining structure, Declaring and accessing structure members, Typedef declaration, Initialization of structure, Arrays of structure, Nested structure, Structures and functions, Pointer to a structure, Self-referential structure. 6.2 Unions, Defining union, Declaring and accessing union members, Initialization of union, Arrays of union variables, Nested union, Union under structure, Differences between structure and union. 6.3 Enumerated data, Assigning and accessing enumerated variables, Enumeration type conversion, comparing and I/O operations on enumerated types.	8	
Unit No.	Contents	Hrs/Unit	Marks
7	**Pre-processor Directives** Introduction, Types of pre-processor directives, Macros, Rules for using macros, Distinction between functions and macros.	2	

8	**User defined Files** Introduction to files, Different modes for opening files, Using formatted and unformatted files in C, Read data from files, Writing data to files, Different functions for random selection of records.	6	
	Practical / Sessional Works		

Skills to be developed**:**

Intellectual skills:
- Use of programming language constructs in program implementation.
- Apply different logics to solve given problem.
- Write program using different implementations for the same problem.
- Identify different types of errors as syntax, semantic, fatal, linker & logical.
- Debugging of programs.
- Understanding different steps and stages to develop complex program.

Motor Skills:
- Proper handling of Computer System**.**

A sample List of Practical / Sessional works to be done (Leading '*' denotes the harder problems)

S. No.	Specific problem(s) related with practical / sessional work	Skill area
01	i) Displaying hexadecimal, decimal, octal number format of the entered numbers. ii) Displaying entered number with leading zeros and trailing zeros. iii) Displaying entered number with right and left justification. iv) Displaying with different formatting specifiers.	Formatted output. (Any two)
02	v) To find greatest / smallest of three numbers. vi) To display pass class, second-class, distinction according to the marks entered from the keyboard. vii) To find even or odd numbers. viii) To display spellings of number 1-10 on entry. ix) Implementation and displaying the menu to execute 1. ADD, 2. SUBTRACT 3. MULTIPLICATION, 4. DIVISION using switch case. x) To check whether there exist real roots of a quadratic equation and if exist find them.	Two way and multiway Branching. (Any four)
03	xi) To display our College name twenty times on screen. xii) To demonstrate Continue and Break statements within loop structure. xiii) To add first 'n' natural, even, odd numbers using different loop structures. xiv) To find GCD, LCM of two integral numbers. xv) To generate simple number triangle for n rows. xvi) To generate Pascal triangle for n rows. xvii) To add the series 1 + (1 + 2) + (1 + 2 + 3) + …+ (1 +2 +3 + …+n) xviii)To generate all prime numbers within the given range. xix) To find all the Armstrong numbers within 100 to 1000. xx)	Loop structure and nested loop structure. (Any six)
S. No.	Specific problem(s) related with practical / sessional work	Skill area
04	xxi) To find the largest and smallest numbers from array elements.	Arrays and

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	xxii) *To sort array elements in ascending / descending order. xxiii) To enter elements for 3X3 matrix and display them. xxiv) To calculate addition / subtraction of 2 dimensional matrix. xxv) *To calculate multiplication of 2 dimensional matrix. xxvi) To find the number of vowels and consonants in a string. xxvii) Implementation of strlen(), strcpy(), strcat() and strcmp() functions. xxviii) To check whether a string is palindrome or not. xxix) *To replace a specific character/string by another character/string in a multiword string. xxx) *To make the abbreviated form of a multiword string.	Strings (Any six)
05	xxxi) To calculate the value of ^nC_r, n≥r using function xxxii) *To find the sum of the series $1 + \frac{x}{1!} + \frac{x^2}{2!} + \cdots \frac{x^n}{n!}$ for n ≥ 1, x ≥ 0 using function. xxxiii) To interchange the biggest and smallest number in to calculate factorial a one dimensional array using function. xxxiv) To calculate factorial of any given number using recursion. xxxv) To demonstrate call by reference, call by value. xxxvi) To read and display an integer array using pointer. xxxvii) To read and display a text using a character pointer to a string. Also count the number of characters, words and lines in the text. xxxviii) *To read, display, add and subtract of two times defined using hour, minutes and values of seconds. xxxix) *To read and display the contents of a structure variable using pointer to a structure.	User defined functions, structures and pointers. (Any five)
06	xl) Handling with unformatted, formatted files in different operational mode. xli) To count the number characters and number of lines in a file. xlii) To copy one file into another by copying one character at a time / multiple characters simultaneously (using fgets() and fputs()). xliii) To write records of student to a file using array of structure and display them accordingly. xliv) *A text menu driven program to append a record, to edit a particular record, to display a predefined record, to delete a particular record from a previously created student file.	Formatted and unformatted files. (Any two)

Text Books			
Name of the Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
ReemaThareja	Programming in C	Second	OXFORD University Press
Kamthane	C programming: Test your skills		Pearson
Venugopal	Mastering C		TMH
E.Karthikeyan	A Textbook on C		PHI
Srivastava	C in Depth		BPB
E. Balgurusamy	Programming in C	Fourth	Tata Mc-Graw Hill
R.S.Bichkar	Programming with C		University Press
David Griffiths	Head First C		SPD
Jeyapoovan	A First Course in Programming with C		Vikas
Amiya Kumar Rath	Programming in C		Scitech
Reference Book			

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Kanetkar	Let Us C		BPB
Steve oualine	Practical C Programming		SPD
NarainGehani	An Advanced Introduction ANSI C		University Press

Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

1. 2. **Websites:**
- **http://cplus.about.com/od/beginnerctutoriali/a/blctut.htm**
- **http://computer.howstuffworks.com/c.htm**
- **http://www.indiastudycenter.com/studyguides/sc/objtest/default.asp**

Demo lectures with power point presentations using LCD projector should be arranged to develop programming concepts of the student.

Name of the Course: Digital Logic Design	
Course Code: CST/3/303	**Semester: Third**
Duration:	**Maximum Marks: 100 (Theory) + 50 (practical)**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Assignment & Quiz: 10(Th.)+25(Pr) Marks
Practical: 2 hrs./week	End Semester Exam.: 70(Th)+25(Pr) Marks
Credit: 3+1	
Aim: To understand Digital electronics and able to design digital circuit and to understand A/D and D/A converter	
Sl. No.	

1.	To study different logic families and number system.
2.	To introduce different logic gates, their Boolean algebra and combinational logic design using those gates.
3.	To learn how to design sequential logic using flip flop. To study different A/D and D/A converters

Objective: Student will be able to

Sl. No.	
1.	Design simple logic circuits.
2.	Assemble logic circuits.
3.	Test the logic circuits.
4.	Observe outputs of logic circuits
5.	Troubleshoot digital circuits.
6.	Use A/D and D/A converters.
7.	Design and verify Sequential circuit.

Pre-Requisite:	
Sl. No.	
1.	Basic knowledge of Basic electronics is helpful.

Contents (Theory)		Hrs./Unit	Marks
Unit: 1 Name of the Topics: Introduction to digital electronics, Boolean algebra, Number system and codes.	1.1 Concept of logic 1.2 Advantages and Disadvantages of Digital circuits 1.3 Introduction to digital ICs, Characteristics of digital ICs 1.4 Logic families comparison of TTL, CMOS and ECL logic Families (No circuits) 1.5 Number System - Introduction to Binary, Octal, Decimal, Hexadecimal number system 1.6 Conversion between Number systems 1.7 1's complement and 2's complement and Binary arithmetic (addition, subtraction) 1.8 BCD code, BCD arithmetic (addition, subtraction).	5	
Unit: 2 Name of the Topics: **Logic Gates And Boolean Algebra**	2.1 Logical symbol, logical expression and truth table of AND, OR, NOT, NAND, NOR, EX-OR and EX-NOR gates. 2.2 Universal gates – NAND and NOR gates 2.3 Logical circuits of basic gates using universal Gates. More than 2 input gates by using 2 input gates 2.4 Basic laws of Boolean algebra, Duality theorem, De Morgan's theorem.	5	
Unit: 3 Name of the Topics: **Combinational Logic Design / Circuits**	3.1 Simplification of Boolean expression using Boolean algebra. 3.2 Construction of logical circuits forms Boolean expressions. 3.3 Boolean expressions using Sum of products and product of sums forms.	12	

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	3.4 K-map representation of logical functions and minimization (2,3,4 variable). 3.5 Standardization of SOP & POS equations 3.6 Truth table, K-map, Simplified logical expression and logical circuit using basic gates and universal gates of: (a) Half adder and full adder. (b) Half subtractor and full subtractor. Binary parallel adder, adder-subtractor, BCD adder. 3.7 Block diagram, Truth table, Logical expression and logic diagram of Multiplexers (4:1 and 8:1), Multiplexer Cascading and use of Multiplexer in implementation of Boolean function. 3.8 Block diagram and Truth table of Demultiplexer (1:4; 1:8; 1:16). Block diagram and Truth table of Encoders and Decoder. Use of Decoder in implementation of Boolean function. 3.9 Design of different code converter, BCD to 7 segment decoder, Comparator, Parity Checker and Generator		
Unit: 4 Name of the Topics: **Flip Flops And Sequential Logic Design**	4.1 One-bit memory cell, concept of clock signal 4.2 Symbol and Logic diagram using NAND gates, working and truth table of R S flip-flop. 4.3 Symbol and Logic diagram using NAND gates, working, truth table and timing diagram of Clocked R S flip flop. 4.4 Triggering: edge triggering and level triggering 4.5 Symbol and Logic diagram using NAND gates, working, truth table and timing diagram of J-K flip flop. 4.6 Block diagram and truth table of Master slave J-K flip flop. 4.7 Symbol, working and truth table of D- flip flop and T-flip flop. 4.8 Excitation table of different Flip-Flop. Conversion of one Flip-Flop to other. <u>Applications of flip flops</u> 4.9 Concept, Modulus, Working, truth table, timing diagram of a counter. 4.10 Asynchronous counter (3 bit, 4 bit); 4.11 Design of mod N-counter: working, truth table and timing diagram 4.12 3-bit Synchronous counter: working, truth table and timing diagram 4.13 Block diagram, Working, Truth Table and waveforms of Shift register: SISO, SIPO, PISO, PIPO (4-bit) and Universal Shift register (4-bit).	10	
Unit: 5 Name of the Topics: **Memories**	5.1 Classification of memories 5.2 RAM, ROM, PROM, EPROM, EEPROM. 5.3 Circuit diagram using CMOS transistors and	5	

	working of Static and Dynamic RAM.		
Unit: 6 **A-D And D-A Converters**	6.1 Circuit diagram and working of R-2R Ladder DAC and Weighted resistor DAC. 6.2 DAC specifications 6.3 Block diagram and working of Ramp ADC, Dual slope ADC and Successive approximation ADC. 6.4 ADC specification 6.5 Advantages and Disadvantages of various methods.	7	
	Total	**15**	

	Contents (Practical)
Sl. No.	Skills to be developed
1.	Intellectual Skills: Able to design, test and debug any digital circuit.
2.	Motor Skills: Exposer to Digital world through studying this.

Suggested list of Laboratory Experiments:

Practical

Sl. No.	Laboratory Experiments
1.	Study of Digital IC datasheets and noting down the characteristics for TTL & CMOS logic families. Pin Diagram
2.	Verification of truth table of logic gates.
3.	Implementation of different gates by using Universal gates.
4.	Formation of more than 2 inputs gate by using 2 input gates only.
5.	Construction of Half adder and Full adder.
6.	Construction of Multiplexers.
7.	Construction of code converters/ decoder drivers.
8.	Verification of truth table of Flip flops by using ICs.
9.	Up-down counters by using JK or T flip flops (IC)
10.	Design of registers by using Flip flops.
11.	Use of A to D Converter(by using IC).

** Any Digital electronics oriented Laboratory experiment can also be done by using PSpice simulation software like Electronics Workbench.

Suggested list of Assignments / Tutorial:

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Kharate	Digital Electronics		Oxford
Mano, Ciletti	Degital Design	5th	Pearson
Salivahanan&Arivazhagan	Digital Circuit & Design		Vikas
SoumitraMandal	Digital Electronics		TMH
A.K.Maini	Digital Electronics		Wiley
Anand Kumar	Fundamentals of Digital Circuits		PHI
R P Jain	Modern Digital Electronics		TMH

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P.Raja	Digital Electronics		Scitech
Gupta, singhal	Digital Electronics		Katson Books
Reference Books:			
Name of Authors	Title of the Book	Edition	Name of the Publisher
Floyd	Digital Fundamentals	10th	Pearson
S P Bali	2000 solved problems in Digital Electronics – Sigma series		TMH

Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

Name of the Course: Computer Engineering Group (**Data structure**)

Course Code: CST/3/304	Semester: Third
Duration: Six months	**Maximum Marks:200 (Practical 50+50)**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Class Test : 20 Marks
Tutorial: hrs./week	Teachers Assessment: 10 Marks
Practical: 3hrs./week	End Semester Exam.: 70Marks
Credit:3+2	

Aim:	
Sl. No.	
1.	To develop skills in selecting or designing and implementing appropriate data structures in developing software to solve problems
2.	To acquaint students with principles of algorithms
3.	To familiarize with control and data structures of C programming language, and abstract data types
Objective:	
Sl. No.	Students will able to:
1.	· Write complex applications using structured programming methods.

2.	· Demonstrate understanding of the abstract properties of various data structures such as stacks, queues, lists, and trees.
3.	· Use various data structures effectively in application programs.
4.	· Implement various data structures in more than one manner.
5.	· Compare different implementations of data structures and to recognize the advantages and disadvantages of the different implementations.
6.	· Demonstrate understanding of various sorting algorithms, including bubble sort, insertion sort, selection sort, heap sort and quick-sort. C
7.	· Compare the efficiency of various sorting algorithms in terms of both time and space.
8.	· Program multiple file programs in a manner that allows for reusability of code.
9.	· Trace and code recursive functions.

Pre-Requisite:	
Sl. No.	
1.	Fundamentals of Programming Languages

Contents (Theory)		Hrs./Unit	Marks
Unit:1 Name of the Topics: Fundamentals of Computer	1.1 Data Representation 1.2 Abstract data Types 1.3 Data Structure and Structured Types 1.4 Atomic Type 1.5 Difference between Abstract Data Types, Data Types And Data Structures 1.6 Data Types 1.7 Linear data type 1.8 Non- Linear data type 1.9 Primitive data type 1.10 Non primitive data type 1.11 Refinement Stages	03	
Unit: 2	**Principles of programming and Analysis of Algorithms:** 2.1 Algorithms 2.2 Different approaches for designing an algorithm 2.3 Complexity 2.4 Big 'O' Notation 2.5 Algorithm analysis	02	
Unit: 3 Name of the Topics: **Introduction to Windows XP/7.**	**Stacks:** 3.1 Introduction to Stacks 3.2 Stacks as an Abstract Data Type 3.3 Primitive operations of stacks 3.3 Representation of Stacks through Arrays 3.4 Representation of Stacks through Linked List 3.5 Application of Stacks 2.6 Stack and Recursion	04	
Unit: 4 Name of the Topics: **Use of Office or Open Office**	**Queues:** 4.1 Introduction 4.2 Queue as an Abstract Data Type	04	

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	4.3 Representation of Queues 4.4 Operations on queue: Searching, Insertion, Deletion. 4.5 Circular Queues 4.6 Priority Queue 4.7 Application of Queues		
Unit: 5 Name of the Topics: **Introduction to Internet**	**Linked List**: 5.1 Introduction, 5.2 Terminologies Node, Address, Pointer, Information, Next, Null pointer, Empty list etc. 5.3 Operations on list Searching, Insertion and Deletion 5.4 Types of lists Linked list and Circular list 5.5 Reverse and Merging Linked list 5.6 Array stacks, queues, implementation using list.	08	
Unit: 6 Name of the Topics: **Usage of Computers in Various Domains**	**Trees:** 6.1 Introduction to Binary Trees 6.2 Types of Trees 6.3 Basic Definition of Binary Trees 6.4 Operations on Binary Search Tree 6.5 Type of tree Binary, Height balanced and Weight balanced tree 6.6 Operations on trees, 6.7 Searching Depth-first search and Breadth-first search 6.8 Traversing Pre-order, In-order and Post-order 6.9 Insertion, 6.10 Deletion,	08	
Unit: 7	**Graphs:** 7.1 Introduction to Graphs 7.2 Terms Associated with Graphs 6.3 Terminology graph, node (vertices), arcs (edge), directed graph, in-degree, out-degree, adjacent, successor, predecessor, relation, Weight, path, length 7.4 Sequential Representation of Graphs 7.5 Linked Representation of Graphs 7.6 Traversal of Graphs 7.7 Spanning Trees 7.8 Shortest Path 7.9 Application of Graph	**06**	
Unit: 8	**Searching & Sorting:** 8.1 Sorting-An Introduction 8.2 Efficiency of Sorting Algorithms 8.3 Bubble Sort 8.4 Selection Sort 8.5 Quick Sort 8.6 Insertion Sort 8.7 Merge Sort 8.8 Binary Tree Sort 8.9 Radix Sort	08	

	8.10 Shell Sort 8.11 Heap Sort 8.12 Searching-An Introduction, Binary Search.		
Unit: 9	Hashing 9.1 Hash functions 9.2 Deleting items from hash tables	02	
Total		**45**	

Contents (Practical)		
Sl. No.	Skills to be developed	
1.	Intellectual Skills: · Use of programming language constructs in program implementation. · To be able to apply different logics to solve given problem. · To be able to write program using different implementations for the same problem · Study different types of errors as syntax semantic, fatal, linker & logical · Debugging of programs · Understanding different steps to develop program such as · Problem definition · Analysis · Design of logic · Coding · Testing · Maintenance (Modifications, error corrections, making changes etc.)	
2.	Motor Skills:· Proper handling of Computer System.	

List of Practical:

Sr. No.	Practical
	Programs based on: Array operations, insertion, deletion
	Programs based on Stacks Implementation of PUSH & POP operations, Evaluate postfix expressions, Infix to postfix conversions.
	Recursive programs: factorial, Fibonacci, Ackerman function, and tower of Hanoi.(any two)
	Programs for demonstrating queue operations. one recursive program converted to non-recursive ones
	Programs based on Linked lists
	Programs based on trees Creating a binary tree, in order, pre order and post order traversal of binary tree, deleting a node from binary tree.

	Programs for implementing various sorting techniques. (Minimum three sorting techniques from topics mentioned in the syllabus))
	Programs for implementing various sorting and searching techniques. (Minimum two searching techniques from topics mentioned in the syllabus.)
	Assignments based on graph theory.
	Program based on hashing.

LIST OF SAMPLE PROBLEMS FOR DATA STRUCTURE LAB(for example)

1. To write a program to check whether a word is palindrome or not.
2. To create a two dimensional array of numbers and calculate & display the row & column sum and the grand total.
3. To write a program of matrix multiplication.
4. To write a program to insert (Push) an element into the sack and delete (Pop) an element from the stack using pointer.
5. To write a program to convert an infix expression to a postfix expression.
6. To evaluate a postfix expression.
7. To write a program to insert an element in the queue and delete an element from the queue using pointer.
8. To create a circular queue and add an element and delete an element from a circular queue.
9. To write a program of a structure containing an item name along with the unit price. The user enters the item name and quantity to be purchased. Program print outs total price of item with name using pointer in a structure or array in a structure.
10. To create a single linked list and — (a) insert a node in the list (before header node, in between two nodes, end of the list); (b0 delete a node from the list (1st node, last node, in between two nodes); (c) Concatenate two lists.
11. To create a doubly linked list and — (a) insert a node in the list (before header node, in between two nodes, end of the list); (b) delete a node from the list (1st node, last node, in between two nodes); (c) Concatenate two lists.
12. To create a circular linked list and insert & delete an element from the list.
13. Write a program to merge two shorted linked list.
14. Write a program to reverse a linked list.
15. To write a program to calculate the binomial co-efficient of $_nC^r$ of two numbers using recursive function. Also write the same program using function in non-recursive way.
16. To write a program to generate Fibonacci Series using recursive function. Also write the same program using function in non-recursive way.
17. To write a program to sort a list of numbers using — (i) Heap Sort, (b) Quick Sort, (c) Bubble Sort.
18. To write a program to sort a list of numbers using — (i) Insertion Sort, (b) Merge Sort, (c) Radix Sort.
19. To write a program to create a binary tree and traverse it in pre-order and post-order form.
20. To write a program to create a binary search tree and — (a) insert a new node in the BST, (b) search a node in the BST, (c) delete a node from the BST.

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Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
ReemaThareja	Data Structures Using C		OXFORD
A.K.Sharma	Data Structures Using C		PEARSON
DebasisSamanta	Classic Data Structures	2nd	PHI

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Lipschutz	Data Structure		TMH
Tenenbaum, Langsam&Augenstein	Data Structures Using C		PEARSON
Horowitz, Sahni	Fundamentals of data Structures		University Press
Prof. P.S Deshpande Prof. O.G. Kakde	C & Data Structures		Dreamtech PRESS
Udit Agarwal	Data Structures Using C		Katson Books
Goyal, Kumar	A Simplified Approach to Data Structure		SPD
Nag	Data Structure and algorithms using C		Vikas
Dr.A.Bhowmick	Data Structure & Algorithm		Schand
A. K. Rath, A. K. Jagadev	Data Structures Using C	2nd	SCITECH

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Kumar & Paul	Data Structure and algorithm		JBBL
Tremblie and Sorrenson	An Introduction To Data Structure With Application		TMH Publications

Suggested list of Assignments / Tutorial:

Sl. No.	Topic on which tutorial is to be conducted
1.	Analyze designed algorithm
2.	Study of dynamic & static Memory allocation
3.	Explain linear, non-linear data structure

Note:

Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

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Name of the Course: Computer Organization and Architecture	
Course Code: CST/3/305	Semester: Third
Duration:	Maximum Marks: 100
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Attendance, Assignment & Quiz: 10 Marks
Practical:	End Semester Exam.: 70 Marks
Credit: 3	
Aim: To understand computer, how it works and its internal structure and to know how to improve the performance of computer by using efficient design issues.	

Sl. No.	
1.	To understand the structure and operational concept of computer system.
2.	To learn the how numbers represented in computers and process them.
3.	To understand memory system and access mechanism of IO devices.
4.	To learn pipelining and parallel processing.

Objective: Student will be able to	
Sl. No.	
1.	Understand a computer system that has hardware and software components, which controls and makes them useful.
2.	Understand the fixed and floating point number representation in computer.
3.	Understand how arithmetic operation will be performed in computer system.
4.	Gain knowledge on Cache and virtual memory.
5.	To understand Interrupt and DMA access.
6.	Gain knowledge on RISC and CISC architecture.
7.	Understand how pipelining and parallel processing improves the performance of computer system.

Pre-Requisite:	
Sl. No.	

1.	Basic knowledge of computer is helpful.
2.	Basic knowledge of number system is helpful
3.	

Contents (Theory)		Hrs./Unit	Marks
Unit: 1 Name of the Topics: Basics of Computer system	1.1 Concept of Von Neumann Architecture and its features. 1.2 Components of Computer system – Structure of CPU, function of Memory unit and IO unit. 1.3 Different generation of Computer system. 1.4 Concept of PC, Laptop, workstation, Server, Super Computer.	3	
Unit: 2 Name of the Topics: **Instruction structure and addressing modes, Number Representation**	2.1 Instruction Format. 0,1,2,3 address instruction. Execution steps of a typical instruction through different parts of CPU and memory. 2.2 Different addressing modes with example. 2.3 Representation of Integers in Computer system. 2.4 Representation of Floating point numbers in computer system. 2.5 Biased exponent, IEEE format for single and double precision numbers.	5	
Unit: 3 Name of the Topics: **Arithmetic**	3.1 Addition/Subtraction unit block diagram and function. 3.2 Multiplication circuit diagram and multiplication of positive numbers. 3.3 Multiplication of negative numbers and Booths algorithm and its flowchart with example. 3.4 Restoring and non-restoring division process with flowchart and example. 3.5 Floating point addition/subtraction algorithm and flowchart (no example).	8	
Unit: 4 Name of the Topics: **Memory and IO devices**	4.1 Memory Hierarchy model and comparison on cost, speed and size. 4.2 Cache memory, Mapping technique, Hit ratio, Replacement algorithm. 4.3 Concept of virtual memory technique, address translation method, TLB. 4.4 Different methods of IO access mechanism 4.5 Programmed IO or Status check IO, Interrupt Mechanism, DMA data transfer, IO processor. 4.6 Different types of interrupt, Priority interrupt, Simultaneous interrupt. 4.7 DMA transfer modes – Burst mode, Cycle stealing mode.	8	
Unit: 5 Name of the Topics: **Control unit design issue**	5.1 Hardwired Control unit design. 5.2 Microprogrammed Control unit design. 5.3 Concept of Horizontal and vertical microprogramming. 5.4 Comparison between hardwired Control unit and microprogrammed control unit.	5	

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Unit: 6 Name of the Topics: **RISC, CISC architecture and pipelining**	6.1 Characteristic features of RISC architecture 6.2 Comparison between RISC and CISC. 6.3 Concept of parallel processing and Flynn's Classification 6.4 Concept of instruction pipelining. 6.5 Space-time diagram, Speed-up due to pipelining. 6.6 Running the pipeline with minimum idling. 6.7 RISC architecture and pipelining. 6.8 Different pipeline hazards and their detection and minimization.	12	
Unit: 7 Name of the Topics: **Vector Processing and Array Processor**	7.1 Concept of vector processing. Techniques used in vector processing 7.2 Speed advantage of vector processing. Vector processing instruction format. 7.3 Concept of array processor. 7.4 Different types of array processors.	4	
Total		**45**	

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Stallings	Computer Organization and Architecture		Pearson
HWANG	Advanced Computer Architecture (SIE)		TMH
Hamacher, Vranesic, Zaky	Computer Organization	5th	TMH
Rao	Computer System Architecture		PHI
Goyel&Sindwani	Computer Organization with Architecture		Katson
Parhami	Computer Architecture		Oxford
Basu	Computer Organization with Architecture		Vikas
Rajiv Chopra	Adv Computer Architecture		Schand

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Rajaraman&Radhakrishnan	Computer Organization and Architecture		PHI
Mano	Digital Logic an Computer Design		Pearson

Note:			
Sl. No.			
1. Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**			

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Name of the Course: Electronics Devices & Circuits	
Course Code: CST/3/306	Semester: Third
Duration:	Maximum Marks: 100 (Theory) + 50 (practical)
Teaching Scheme	Examination Scheme
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Assignment & Quiz: 10(Th.)+25(Pr) Marks
Practical: 2 hrs./week	End Semester Exam.: 70(Th)+25(Pr) Marks
Credit: 3+1	

Aim:This subject will enable the students to comprehend the concepts and working principle of electronics devices and circuits and their application in electronic system. The knowledge acquired by student will help them to troubleshoot and repair electronic circuits and devices.

Sl. No.	
1.	To study Different Diode and transistor with their Characteristics.
2.	To Rectifier and Power supply.
3.	To learn about OPAMP, timer, SCR, UJT etc.
4.	To know the basics of LED, LCD, photodiode, phototransistor and solar cell.
5.	To understand the basics of ICs.

Objective: Student will be able to

Sl. No.	
1.	Identify the electronics circuit element.
2.	Know the characteristics of different semiconductor devices.
3.	To make simple semiconductor circuit and to test them.
4.	Observe outputs of the circuits
5.	To make rectifier circuits.

Pre-Requisite:	
Sl. No.	
1.	Knowledge of Physics (specially semiconductor) is helpful.

Contents (Theory)		Hrs./ Unit	Ma rks
Unit: 1 Name of the Topics: DIODE	1.1 Elementary idea of ordinary diode, Forward biased and Reverse biased condition, VI characteristics of ordinary diode 1.2 BREAKDOWN:Zener and avalanche – Construction of and operation of Zener diode in reverse biased condition. 1.3	4	

	Characteristics and equivalent circuits, specifications – Simple voltage regulator circuit		
Unit: 2 Name of the Topics: **Bipolar Transistor**	2.1 Construction and operation of NPN and PNP transistors- V-I characteristics, transistor in active, saturation and cut-off-CE, CB, CC configuration and their differences, 2.2 Definitions of current gains and their relationship. I. Concept of Q-point – AC and DC load line – Stabilization and stability factor II. TYPES OF BIASING**:** (a) Base Bias, (b) Collector Feedback Bias, (c) Emitter Feedback Bias, (d) Potential Divider Bias. 2.3 Transistor as simple small signal amplifier & oscillator and their simple applications	7	
Unit: 3 Name of the Topics: **FIELD EFFECT TRANSISTOR**	3.1 Construction, operation and VI characteristics of JFET, pinch-off voltage, drain résistance, transconductance, amplification factor and their relationship 3.2 Enhancement and depletion type MOSFET- concepts of CMOS 3.3 Differences between BJT and JFET	4	
Unit: 4 Name of the Topics: **RECTIFIER & POWER SUPPLY**	4.1 Half-wave and full-wave rectifier, average voltage, rms voltage, efficiency and ripple factor, percentage voltage regulation, 4.2 Function of filter circuits**:** Capacitor input filter, inductive filter, Π type filter – Calculation of ripple factor and average output voltage 4.3 Series and shunt regulator using transistor, IC regulator 4.4 Concept of switch mode power supply 4.5 Block schematic description of uninterrupted power supply.	12	
Unit: 5 Name of the Topics: **OPERATIONAL AMPLIFIER**	5.1 Circuit operation of differential amplifier. 5.2 Introduction to operational amplifier – Inverting and non-inverting mode and their gain calculation – Common mode rejection ratio – Bias current – Offset voltage and current – Slew rate, open loop and closed loop gain – Input and output impedance – Frequency response and virtual ground 5.2 Applications of OPAMP as**:** Adder, Subtractor, Voltage Follower, Integrator, Differentiator, Comparator, Schmitt Trigger	7	
Unit: 6 **TIMER CIRCUITS**	6.1 Principle of operation of electronic timer 6.2 Functional description of internal blocks of timer IC555 6.3 Use of 555 timers in monostable and astable mode 6.4 Principle of operation of digital timer	4	
Unit: 7 **ELEMENTARY IDEA OF UJT & SCR**	7.1 Basic construction and operation of UJT and SCR	2	

Unit: 8 **OPTOELECTRONICS**	8.1 Elementary ideas of LED, LCD, 8.2 Photodiode, Phototransistor and Solar cell and their applications	3	
Unit: 9 **INTEGRATED CIRCUITS**	9.1 Basic idea of ICs – Classifications: linear and digital ICs, 9.2 SSI, MSI, LSI and VLSI – field of applications	2	
Total		**45**	

Contents (Practical)

Sl. No.	Skills to be developed
1.	Intellectual Skills: Able to design, test and debug SEMICONDUCTOR CIRCUIT.
2.	Motor Skills:Can able to design better semiconductor circuit.

Suggested list of Laboratory Experiments:

Practical

Sl. No.	Laboratory Experiments
1.	To be familiar with the common assembly tools.
2.	To be able to identify the following passive and active circuit elements**: —** diode, transistors, SCR, DIAC, TRIAC, LED, LCD, photodiode, phototransistors, ICs etc.
3.	To be familiar with the following basic instruments**: —** Multimeter, oscilloscope, power supply and function generator.
4.	To study the VI characteristics of an ordinary diode and reverse biased Zener diode.
5.	To study the rectifier with and without capacitor filter for**:** (a) half-wave rectifier ;(b) full-wave rectifier; (c) bridge rectifier.
6.	Determination of frequency response characteristics of RC coupled amplifier circuit and calculation of bandwidth, midband gain, input impedance and out-put impedance for**:** (a) single stage amplifier; (b) double stage amplifier
7.	To study the following applications of op-amp using IC741**:** (a) adder; (b) subtractor; (c) differentiator (d) integrator; and, (e) voltage follower.
8.	To study the characteristics of IC555 timer connected as**:** (a) astablemulti-vibrator; (b) monostablemulti-vibrator.

** Any Electronics oriented Laboratory experiment can also be done by using PSpice simulation software like Electronics Workbench or Open Source software.

Suggested list of Assignments / Tutorial:

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Boylestad&Nashalsky	Electronic Devices and Circuit Theory	10th	Pearson
Salivanan	Electronic Devices and Circuits		TMH
Floyd	Electronic Devices	7th	Pearson
Bell	Electronic Devices and Circuits		OXFORD
Maini& Agarwal	Electronic Devices and Circuits		WILEY
Malvino	Electronic Principles		TMH
Nagrath	Electronic Devices and Circuits		PHI

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Bogart, Beasley & Rico	Electronic Devices and Circuits	6th	Pearson
Floyd &Buchla	Fundamentals of Analog Circuit	2nd	Pearson
Reference Books:			
Name of Authors	Title of the Book	Edition	Name of the Publisher
Singh & Singh	Electronic Devices and Circuits	2nd	Pearson
Chattopadhayay	Analog Electronics		Knowledge Kit Publication

Note:	
Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

** For All Theoretical SubjectMarks of End Semester Examination will be distributed as – 20 (Objectives- Answer should be given with explanation and avoid fill in the blank type questions) + 50 (Subjective – covering whole syllabus properly).

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Name of the Course : Professional Practice-I (PC Maintenance)	
Course Code: CST/3/PP-I	Semester: Third
Duration: Six Months	**Maximum Marks:50**
Teaching Scheme:	**Examination Scheme:**
Practical/ Sessional: 2Hrs/week	Practical / Sessional : 50 (Internal)
Credit: 2	
Aim of the Course:	

S. No.	Aims about	
1.	To do the maintenance of the Computer, peripherals and its add-on cards.	
2.	To understand basic working of the computer motherboard, peripherals and add-on cards	
3.	To select the proper peripheral as per their specification and requirement.	

Objective of the course:

S. No.	The students will be able to -
1.	Debug and repair the faults in system.
2.	Assemble the system.
3.	Load the operating system and device drivers in the system.

Pre-Requisites -

S. No.	
1.	Computer software and elementary hardware knowledge.
2.	PC configuration and setup, quality requirement
3.	Personal computer hardware troubleshooting.

Practical / Sessional Works

Skills to be developed**:**

Intellectual skills:

> ➤ Understanding basic hardware of computer.
> ➤ Fault finding of input/output devices.
> ➤ Troubleshooting of input/output devices.
> ➤ Proper connection of input / output devices.

Motor Skills:

> ➤ Proper handling of Computer System hardware**.**

A sample List of Practical / Sessional works to be done)

S. No.	Specific problem(s) related with practical / Sessional work	Skill area
01	Drawing the motherboard layout of Pentium IV and studying the chipset through data books or Internet.	Perception
02	CMOS setup of Pentium.	BIOS
03	Hard Disk Partitioning.	Logical Storage
04	Study of HDD: Identify various components of HDD and write their functions.	Storage Devices
05	Study and installation of any one display cards: VGA or SVGA display cards.	Display devices & Driver
06	Installation of Scanner, Printers and Modems.	Different accessories
07	Study of SMPS (ATX)	Power Supply
08	Assembling and disassembling of Personal Computer	Operational ability
09	Study of Diagnostic Software's. (Any one)	Applications
10	Fault findings:	Fault detection

	(a) Problems related to monitor. (b) Problems related to CPU.	and correction

S. No.	Specific problem(s) related with practical / Sessional work	Skill area
11	Installation of Operating System.	Installation
12	Configuration of Client and Server PC, Laptop and Network components.	Execution
13	RS232C communication between two computers.	Networking

Text Books:			
Name of Authors	Titles of the Book	Edition	Name of the Publisher
Mike Meyers,Scott Jernigan	Managing &Troubleshooting PCs		Tata McGraw Hill
Bigelow	Bigelow's Troubleshooting, Maintaining & Repairing PCs		Tata McGraw Hill
Mark Minasi	The Complete PC Upgrade & Maintenance Guide		Wiley
Scott Muller	Upgrading & Repairing PC		Techmedia
Gupta	Comdex Hardware & Networking Course Kit		Dreamtech
James	Computer Hardware: Installation, Interfacing, Trouble Shooting and Maintenance		PHI
Dr.SachinKadam	Computer Architecture and Maintenance		SPD
** During Internal Examination all departmental Lecturers should be present.			

Format of the Syllabus

Name of the Course: Microprocessor & Programming	
Course Code: CST/4/401	Semester: Fourth
Duration:16 weeks	Maximum Marks: 100 (Theory) + 50 (practical)
Teaching Scheme	Examination Scheme
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Assignment & Quiz: 10(Th.)+25(Pr) Marks
Practical: 2 hrs./week	End Semester Exam.: 70(Th)+25(Pr) Marks
Credit: 3+1	

Aim: To understand Digital electronics and able to design digital circuit and to understand A/D and D/A converter	
Sl. No.	
1.	To study Architecture and memory management of 8 bit & 16 bit microprocessor (i.e. 8085 & 8086).
2.	To study assembly language programming technique and use of DEBUG command.
3.	To implement different system interfacing.

Objective: Student will be able to	
Sl. No.	
1.	Draw block diagram for architecture of 8085 and to know all the pin function.
2.	Draw block diagram for architecture of 8086 and to know all its pin function.
3.	Describe concepts of pipelining segmentation and address generation.
4.	To know the instruction set and addressing modes.
5.	Write the efficient Assembly Language Program for different problem statements and use of procedures and macros.
6.	Design interface of memory chips.
7.	Design and verify Sequential circuit.

Pre-Requisite:	
Sl. No.	
1.	Basic knowledge computer architecture and digital electronics is helpful.

Contents (Theory)		Hrs./Unit	Marks
Unit: 1	**Basics of Microprocessor** 1.1 Evolution of Microprocessor and types 1.2 Silent features of 8085 Microprocessor, architecture of 8085 (Block diagram), pin diagram, register organization, limitations of 8-bit Microprocessor. 1.3 8085 interrupt structure	6	
Unit: 2	**16-bit Microprocessor 8086** 2.1 Silent features of 8086 Microprocessor, architecture of 8086 (Block diagram, signal description), register organization, concepts of pipelining, 2.2 memory segmentation and memory address generation from segment offset address. 2.3 Minimum and Maximum Mode operation and diagram	10	

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	2.4 8086 interrupt structure.		
Unit: 3	**8086 Instruction set** 3.1 Concept of Machine Language, Instruction format, addressing modes. 3.2 Instruction set (Arithmetic, logical, data transfer, bit manipulation, string, program control transfer, process control)	06	
Unit: 4	**The art of assembly Language Programming** 4.1 Assembly Language Programming Tools Editors, Assembler, Linker, Debugger. 4.2 Assembler directives, model of 8086 assembly language programming, programming using assembler.	06	
Unit: 5	**Procedure and Macro** 5.1 Defining Procedure (Directives used, FAR and NEAR, CALL and RET instructions) 5.2 Defining Macros. 5.3 Assembly Language Programs using Procedure and Macros. 5.4 DOS interrupt services.	08	
Unit: 6	**System Interfacing** 6.1 Interfacing Techniques (I/O mapped I/O, Memory mapped I/O, memory and I/O addressing, 8086 addressing, and address decoding, memory interfacing as Even and Odd bank) 6.2 Interfacing 8255, Block diagram, modes of operation. 6.3 8259: Block diagram, Characteristics and function only. 6.4 8257/8237: Block diagram, Characteristics and function only.	09	
Total		**45**	

Practical:

Skills to be developed:

Intellectual skills

- Use of programming language constructs in program implementation.
- To be able to apply different logics to solve given problem.
- To be able to write program using different implementations for the same problem
- Study different types of errors as syntax semantic, fatal, linker & logical
- Debugging of programs
- Understanding different steps to develop program such as

    · Problem definition

    · Analysis

    · Design of logic

    · Coding

    · Testing

    · Maintenance (Modifications, error corrections, making changes etc.)

- • Motor skills
- • Proper handling of Computer System.

List of Practical:

1) Basics of Assembler, linker, debugger, editor
2) Write an Assembly Language Program to
   ➢ Add / Sub two 16 bit numbers.
   ➢ Find sum of series of numbers.
   ➢ Multiply two 16 bit unsigned/ signed numbers.
   ➢ Divide two unsigned/ signed numbers (32/16 , 16/8, 16/16, 8/8)
   ➢ Add / Sub / Multiply / Divide two BCD numbers.
   ➢ Find smallest/ largest number from array of n numbers.
   ➢ Arrange numbers in array in ascending/ descending order.
   ➢ Perform block transfer data using string instructions / without using string instructions.
   ➢ Compare two strings using string instructions / without using string instructions.
   ➢ Display string in reverse order, string length, Concatenation of two strings.
   ➢ Convert Hex to Decimal, Decimal to Hex.

   ** Practical can also be done by using DEBUG command. Any program other than those given in the list will be appreciated.

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Das	The X 86 Microprocessors: Architecture, Programming and Interfacing (8086 to Pentium)		Pearson
Krishna Kant	Microprocessors and Microcontrollers		PHI
Ray &Bhurchandi	Advance Microprocessor and Peripherals		TMH
Hall	Microprocessors and Interfacing		TMH
Senthil Kumar	Microprocessor and Microcontroller		Oxford
Mazidi	**The X86 PC: Assembly Language, Design, and Interfacing, 5/e**		Pearson
Short	Microprocessors and Programmed Logic, 2e		Pearson
Nagoorkani	Microprocessors and Microcontrollers		TMH
Triebel	The 8088 and 8086 Microprocessors: Programming, Interfacing, Software, Hardware, and Applications, 4e		Pearson
Mathur	Microprocessors and Interfacing		PHI
Savaliya	8086 Programming and advance processor architecture		Wiley
Azeez, Shemeena	Microprocessors Interfacing and Microcontroller		Scitech
Singh &Chabra	Fundamentals of Microprocessor and its Application		SChand

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Chhabra	The Intel 8086/8088 microprocessor Architecture, Programming Design & Interfacing		DhanpatRai

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Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

Format for Syllabus

Name of the Course: Computer Engineering Group (**Computer Network**)	
Course Code: CST/4/402	**Semester: FOURTH**
Duration:	**Maximum Marks: 150 (Practical 25+25)**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Class Test: 20 Marks

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Tutorial:	hrs./week	Teachers Assessment:	10	Marks
Practical:	2 hrs./week	End Semester Exam.:	70	Marks
Credit: 4				

Aim:	
Sl. No.	
1.	To learn basic concepts of Computer networks.
2.	To study hardware in detail required for networking.
3.	To learn in detail basic models of networking -ISO OSI and TCP/IP.

Objective:	
Sl. No.	Students will able to:
1.	· Identifying the benefits of network.
2.	· Distinguish between Network classifications.
3.	· Describe different types of Topology.
4.	· Describe different types of Network devices.
5.	· Compare different transmission media.
6.	· Compare OSI and TCP/IP model.
7.	· Configure TCP/IP.

Pre-Requisite:	
Sl. No.	
1.	Fundamentals of Programming Languages

Contents (Theory)		Hrs./Unit	Marks
Unit: 1	**INTRODUCTION TO DATA COMMUNICATION NETWORKING** 1.1 Data communications: components, data representation. 1.2 BASIC CONCEPTS: Servers, Client, Workstation, Hosts (definition & applications) 1.3 TYPES OF COMPUTER NETWORKS: LAN, MAN and WAN. 1.4 TYPES NETWORK ARCHITECTURE: Peer-to-peer, Client-Server and Distributed. 1.5 Simplex, Half duplex and Full duplex 1.6 Parallel and Serial, Asynchronous and Synchronous 1.7 Definition and different types of Noise, Nyquist rate, Shannon's Capacity. 1.8 Network Features - File Sharing; Printer Sharing; Application Services; EMail; Remote Access.	05	
Unit: 2	**Network Topologies and Networking Devices:** 2.1 Type of Topology - Bus Topology; Ring Topology; Star Topology; Mesh Topology; Tree Topology; Hybrid Topology. 2.2 Network Control Devices -Hubs; Switches; Routers; Bridges; Repeaters; Gateways; Modems	03	
Unit: 3	**Transmission Media:**	04	

	3.1 Guided Media -Twisted Pair -UPT, STP; Coaxial Cable; Optical Fiber - Optical Fiber Structure, Light Source for Fiber, Propagation Mode, Advantages of optical fiber and Disadvantages of optical fiber. 3.2 Un-Guided Media: Wireless Communication – Communication Band; Microwave Communication; Satellite Communication – Access Method; Cellular (Mobile) Telephone – Band in Cellular Telephony, Calls Using Mobile Phones, Transmitting receiving operations; New Developments.		
Unit: 4	4.1 OSI Reference Model - Interlayer Communication – Data Encapsulation, Horizontal Communication, Vertical Communication, Encapsulation Terminology; Physical layer; Data link layer; Network layer; Transport layer; Session layer; Presentation layer; Application layer. 4.2 TCP/IP Reference Model – Link; Internet; Transport; Application layer. 4.3 Comparison of the OSI and TCP/IP reference models.	**03**	
Unit: 5	5.1 MULTIPLEXING: FDM, TDM, WDM, ADM, OFDM. 5.2 SWITCHING: Circuit Switching : time division & space division switch, Packet Switching, Message Switching.	04	
Unit: 6	**Data link layer** 6.1 Types of Error, Framing(character and bit stuffing), error detection & correction methods. 6.2 Flow control and Error control mechanism.	04	
Unit: 7	**Medium access sub layer** 7.1 Point to point protocol, FDDI, token bus, token ring; Reservation, polling. 7.2 Medium Access Control: Motivation for a specialized MAC: Hidden and Exposed terminals. Near and Far terminals; **7.3** FDMA, TDMA: Fixed TDM, Classical Aloha, Slotted Aloha, Carrier sense multiple access, Demand assigned multiple access, Multiple access with collision detect, Multiple access with collision avoidance, Inhibit sense multiple access; CDMA;	**05**	
Unit: 8	8.1 Protocols, Services and Standards (in brief): X.25, ATM, ISDN, Token Ring and Token Bus.	**02**	
Unit: 9	**9.1 Routing** : techniques, static vs. dynamic routing , routing table for classful address; Routing algorithms: shortest path algorithm, flooding, distance vector routing, link state routing; 9.2 IP Addressing - IP Address Assignments; IP Address Classes; Subnet Masking; Registered and unregistered Addresses. Congestion control algorithm: Leaky bucket algorithm, Token bucket algorithm, choke packets; 9.3 Quality of service: techniques to improve Qos.	**04**	
Unit: 10	**TCP/IP Fundamentals:** 10.1 TCP/IP Protocols - SLIP and PPP; ARP; IP; ICMP; TCP	03	

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	and UDP.		
Unit: 11	**APPLICATION LAYER** Definition of Internet and compare with Intranet – URL – HTTP – HTML. DNS; SMTP, SNMP, FTP, WWW;	03	

Unit: 12	**NETWORK SECURITY**
	
	    12.1 Encryption (Private and Public key) – Decryption – Digital Signature.
	    12.2 Firewalls
	Cyber Security
	12.3 Introduction to Cybercrime: Definition- Cybercrime and Information Security – Classification of Cybercrimes.
	12.4 **Cyber offenses**: Introduction- Criminals Plan the Attacks – Social Engineering – Cyber stalking – Attack Vector – Cloud Computing
		05	

	Total	45	

	Contents (Practical)		
Sl. No.	Skills to be developed		
1.	**Practical:** Skills to be developed: Intellectual skills: · Fault finding of network · Troubleshooting of network · Proper installation of network Motor skills: · Proper handling of Computer System hardware. · Testing · Maintenance (Modifications, error corrections, making changes etc.)		
2.	Motor Skills: · Proper handling of Computer System**.**		

List of Practical:

LIST OF SAMPLE PROBLEMS FOR DATA STRUCTURE LAB(for example)

1 Creating Windows 2003 Server Boot Disk.
2 Installing Windows 2003 Server &UNIX / Linux
3 Installing Active Directory
4 Creating AD Objects
5 Setting up Local Print Device & Installing and Configuring a Network – Capable Print Device
6. Create new Users & give the Permission
7 Use step by step procedure for i.e. File sharing & Printer sharing.
8 Compare different Network Topologies.

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9 Compare Network directing devices.
i.e. Hub, Switch, Router.

10 To study crimping: RJ-45, RJ-11, Cross-over Cable and Create a Network cable using RJ45 connectors.

11. To study the different expansion slots of a motherboard, set the NIC to expansion slot and to install the driver.
12 To locate MAC address of computer.

13. To make a peer-to-peer Network System.
14. Implementing a TCP/IP Network configuring

15. To run the following application in a network system and get knowledge**:**

(i) FTP, (ii) Telnet, (iii) Mail, and, (iv) Talk.

16. To use the ping utility in order to understand its use in a troubleshooting environment.

17. To be familiar with loop back testing.

18. To be familiar with the idea of socket and to write a socket program.

————————

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Prakash C. Gupta	**Data Communications and computer Networks**	2nd	PHI
DR. Sanjay Sharma	**A Course in Computer network**		KATARIA
N. Olifer, V. Olifer	**Computer Networks Principles, Technologies and protocols for network Design**		WILEY
Uyless Black	Computer Networks Protocols, Standards, and interface		PHI
Nina Godbole&SunitBelapure	**CYBER SECURITY**		WILEY India
Halsall Kulkarni	Computer Networking and the Internet		Pearson
B.A.Farouzan	Data Communication and networking (Global Edition)		TATA McGraw hill
Dostalek	Understanding TCP/IP		SPD
Agarwal,Tiwari	**Data Communication and Computer Networks**		Vikas
Rajesh	**Computer Networks:Fundamentals and Applications**		Vikas
Poorna	**Computer Network**		Scitech

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
A.S.Tanenbaum	Computer networks		PHI
Anderson	Head First Networking		SPD
Kumar,Paul	Computer Networks		JBBL
Nagpal	Data Communication & Network		Schand

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Justin Sophia	Networks and programs		Scitech
Suggested list of Laboratory Experiments:			
Sl. No.	Laboratory Experiments		
1.	Basic TCP/IP utilities and commands. (eg: ping, ifconfig, tracert, arp, tcpdump, whois, host, netsat, nslookup, ftp, telnet etc...)		
2.	Configure a router (Ethernet & Serial Interface) using router commands including access lists on any network simulator (eg. packet Tracer)		
3.	Network design and implementation for small network using actual physical components with IP address scheme		
Suggested list of Assignments / Tutorial:			
Sl. No.	Topic on which tutorial is to be conducted		
1.	Configuration of any three of the following of for each student a) Remote Login Service – TELNET/SSH b) Configuration of FTP server and accessing it via FTP Client.		
2.	Installation of NS-2. Test network animation on Network Simulator2 (NS2).		
Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**			

Format for Syllabus

Name of the Course:Relational Database Management System	
Course Code: CST/4/403	**Semester: Fourth**
Duration:	**Maximum Marks:100(Theory) + 100 (practical)**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Assignment & Quiz: 10(Th.)+50(Internal Practical) Marks
Practical: 3hrs./week	End Semester Exam.: 70(Th)+50(External Practical)Marks
Credit: 3+1	

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Aim:	
Sl. No.	
1.	To study and understand the basic concepts of RDBMS.
2.	To learn SQL and PLSQL in detail.
3.	To learn how to work with any database.
Objective: Student will be able to	
Sl. No.	
1.	Understand the concept of Database system and Client Server Architecture
2.	Understand and develop the concepts of Data Modeling, Security and Integrity.
3.	Understand and execute different SQL queries and PL / SQL programs.
4.	Normalize the database using normal forms.
5.	Understand the concept of query processing and Transaction processing.

Pre-Requisite: Basic knowledge of computer is helpful.			
Contents (Theory)		Hrs./Unit	Marks
Unit:1	**Database System Concept & Data Modeling** 1.1 Basic concepts, Advantages of a DBMS over file processing system,Data Abstraction, Database Languages, Data Independence. 1.2 Components of a DBMS and overall structure of a DBMS. 1.3 Data Models: • Network Model • Hierarchical Model • E-R Model 1.4 Client Server Architecture:	10	
Unit: 2	**Relational Data Model and Security and Integrity Specification** 2.1 Relational Model: Basic concepts, attributes and domains, Keys concept : Candidate and primary key, Integrity constraints: Domain ,Entity Integrity constraints and On delete cascade. 2.2 Security and Authorization. 2.3 Query Languages: • Relational Algebra , Relational Calculus • Views.	8	
Unit: 3	**SQL and PL-SQL** 3.1 Introduction to SQL queries,Creating ,Inserting ,Updating and deletingtables and using constraints, Set operations & operators, Aggregate functions ,string functionsand date ,time functions, Null values, Nested sub queries, Complexqueries,Join concepts. 3.2 PL/SQL Introduction, PL/SQL block structure ,variables,SQL statements in PL/SQL, PL/SQL control Structures ,Cursors , Triggers , Functions ,Packages,	14	

	procedures. Error handling in PL/ SQL		
Unit: 4	**Relational Database Design, Storage and File systems**. 4.1 Purpose of Normalization, Data redundancy and updating anomalies, Functional Dependencies and Decomposition, 4.2 Process of Normalization using 1NF, 2NF, 3NF, multivalued dependencies and BCNF. 4.3 E-R Model details. 4.4 File Organization, Organization of records in files, Storage of Object Oriented databases, Basic concept of Indexing and Hashing.	8	
Unit: 5	**Query Processing and Transaction Processing** 5.1 General strategies for query processing, Equivalence expressions, Selection & join operation. 5.2 Concept of transaction, States of transactions, Concurrent Executions, Serializability Recoverability, Transaction Definition in SQL.	5	
	Total	**45**	
	Contents (Practical)		

Skills to be developed:
Intellectual skills:
1. Develop the fields of data base
2. Decide proper specifications
3. Query Processing and transaction processing
Motor skills:
1. Prepare appropriate data tables
2. Sequential writing of steps
List of Practical:
1) Creating & Executing DDL in SQL.
2) Creating & Executing Integrity constraints in SQL.
3) Creating & Executing DML in SQL.
4) Executing relational, logical and mathematical set operators using SQL.
5) Executing group functions
6) Executing string operators & string functions.
7) Executing Date & Time functions.
8) Executing Data Conversion functions.
9) Executing DCL in SQL.
10) Executing Sequences and synonyms in SQL.
11) Execute 50 SQL queries (operators, functions, clauses, join concepts)
12) Program for declaring and using variables and constant using PL/SQL.
13) Program using if then else in PL/SQL
14) Program using for loop & while loop in PL/SQL.
15) Program using nested loop in Pl/SQL.

** **Practice of different types of Query is essential. Use of any "open source database software" is highly appreciated.**

Suggested List of Laboratory Experiments :
1 VB database connectivity
2 Miniproject-1
3 Miniproject-2

Suggested List of Assignments/Tutorial :

1 Create ER diagram for student database.
2 Create ER diagram for Hospital management.
3 Write difference between DDL and DML.

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Korth	Database Sytem Concept		TMH
Date,Kanan&Swaminathan	An Introduction to Database Systems		Pearson
Singh	Database Systems		Pearson
Navathe	Fundamentals of Database System		Pearson
2006 ISRD Group	Introduction to Database Management System		TMH
Chopra	Database management System		S.Chand
Desai	An Introduction to Database System		West publishing Company
Allen	Introduction to Relational Databases and SQL programming.		Wiley
Raghu Ramakrishnan, Johannes Gehrke	Database Management Systems		TMH
Chakraborty	Advanced Database Management System		Dreamtech
Pakhira	Database Management System		PHI
Ivan Bayross	Database Concepts of Beginners		SPD
C.J.Date	Database design and relational Theory		SPD
Alexis,Mathews	Database Management System		Vikas

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Deshpande	SQL and PL/SQL for Oracle 11g		Dreamtech
Dasgupta	Database Management System, Oracle. SQL and PLSQL		PHI
Priyadarsini	Database management System		Scitech

Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

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Format for Syllabus

Name of the Course : Object Oriented Programming	
Course Code: CST/4/404	Semester: Second
Duration: Six Months	Maximum Marks: 150
Teaching Scheme:	Examination Scheme:
Theory: 3 Hrs/week	Class Test: 20 Marks, TA: 10
Tutorial: Nil	Assignment & Sessional: 25 (Internal)+25 (Ext.)
Practical/ Sessional: 3 Hrs/week	End semester Exam: 70
Credit: 3 + 1	
Aim of the Course:	

S. No	Aims about
1.	The aim of this course is to teach the principles underlying Object Oriented Programming through C++
2.	To increase reusability in programming.
3.	To reduce the costs of developing and adapting software to meet new requirement.

Objective of the course:

S. No	The students will be able to -
1.	Write programs using objects & classes.
2.	Develop programs to create and destroy the objects using constructors and Destructors.
3.	Use existing operators for different meanings in Operator Overloading concept.
4.	Using reusability concept through Inheritance concept.
5.	Implement pointers for arrays, strings & object.
6.	Describe polymorphism, concepts, its types, virtual function & write program for same.
7.	Apply formatted & unformatted console I/O operation & perform file related activities using C++ streams.

Pre-Requisites -

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S. No	
1.	Interaction with DOS / Windows Operating System.
2.	Ability to develop logic / flow of simple problem.
3.	Basic Concepts of 'C'.

Unit No.	Contents	Hrs/Unit	Marks
1	**Concept of Object Oriented Programming.** 1.1 **History & features:**It's need & requirement, procedure oriented programming versus object oriented programming, basic concepts object oriented programming, object oriented languages, object based languages. 1.2 **Beginning with C++**: Concepts & structure of C++ programming, insertion and extraction operators, objects of input and output stream class. Uses of iostream.h header file.	5	
2	**Objects & Classes:** 2.1 Specifying a class, Defining member functions, Arrays within a class, Creating objects, memory allocation for objects, static data & member function, Arrays of objects, objects as function argument. 2.2 Class specifiers and their uses, distinction between structure (struct) of C and Class.	5	
3	**Constructors and Destructors**. 3.1. Concept of Constructor (Default, Parameterized, Copy), Zero argument and explicit Overloaded Constructors, Destructors and properties, uses of destructors.	6	

Unit No.	Contents	Hrs/Unit	Marks
3	**Function and Operator Overloading** 3.2 Function overloading, Inline member functions, constant member functions. 3.3 Operator overloading (overloading unary & binary operators), rules for overloading operators. Type Conversion: Conversions from basic to class type, class to basic type, class to class type. Operators that can not be overloaded.		
4	**Inheritance** 4.1. Concepts of inheritance, Derived classes, Member declaration (Protected), Types of inheritance (Single, multilevel, multiple, hierarchical, Hybrid inheritance), Ambiguity in multiple inheritance. 4.2 Virtual base classes, Abstract classes, Constructors in derived classes. 4.3 Class within class, containership, IS A and HAS A relationship and their differences, Namespaces.	6	

	4.4 Friend function, Friend Class, advantages and disadvantages of friends.		
5	**Pointers in C++** 5.1. Concepts of pointer (Pointer declaration, pointer operator, address operator, pointer expressions, and pointer arithmetic), Pointers & functions (Call by value, call by reference. 5.2. Pointers & objects (Pointers to objects, this pointer, and pointer to derived classes). 5.3. Memory management through pointer: new, delete, operators and free(), malloc(), calloc() functions, Member dereferencing Operators.	8	
6	**Polymorphism** 6.1. Concepts of polymorphism, types of polymorphism, Overloading & overriding, Overloading Virtual function, Static & dynamic binding. 6.2 Pure Virtual functions, Virtual Constructors and Destructors.	5	
7	**Exception Handling** Concepts and uses of exception handler, the try /throw/ catch construct, uses and implementation of multiple exceptions, limitation of exception handling.	4	
8	**Templates** Concepts of Templates, Function and Class Templates, Advantages of templates.	2	
9	**Basic function of I/O system basics & File Processing** Stream classes, using formatted & unformatted functions, using manipulator to format I/O, Basics of file system, opening & closing a file, reading & writing character from a file (get, put, get line, write), Command line arguments.	5	
Practical / Sessional Works			

Skills to be developed**:**

Intellectual skills:
- ➢ Use of programming language constructs in program implementation.
- ➢ Apply different logics to solve given problem.
- ➢ Write program using different implementations for the same problem.
- ➢ Identify different types of errors as syntax, semantic, fatal, linker & logical.
- ➢ Debugging of programs.

Motor Skills:	➢ Understanding different steps and stages to develop complex program. ➢ Proper handling of Computer System**.**	

A sample List of Practical / Sessional works to be done (Leading '*' denotes the harder problems)		
S. No.	Specific problem(s) related with practical / sessional work	Skill area
01	i) Programs to input & output data (Simple programs). ii) Write a program which read a value and print to decimal, octal and hexadecimal. iii) *Displaying entered number with different manipulators like setbase, setw, setprecision etc.	Formatted output. (Any two)
02	iv) To create a simple class with three different member data (int, float and char). Write member function to insert data into those members and display them accordingly. v) To find greatest / smallest of three numbers using OOP in C++. vi) Create a student class with data members as roll, name and marks with respective data types as int, chars and float. Now create n objects of student type and insert data into those objects. Display the student information who got the highest mark. vii) Write an OOP in C++ to add, subtract and multiplication of two matrices of size 3X3. viii) Create a class complex with real and imaginary part (integer). Implement default, parameterized and copy constructor to initialize the objects of complex class and display them. ix) Implement Destructors. x) *Create a class complex as above. Now add, subtract and multiply on two objects of complex type i) using objects as function argument, ii) returning object from function. xi) *Create a class distance with foot and inch. Now add and subtract between two objects of distance type i) using objects as function argument, ii) returning object from function. xii) Implement a counter class with a static member count. Create different objects of counter class to show the behaviour of count.	Class, object, arrays of objects, member data & member function.
03	*Design a base class which has following data members with requisite data types. a) Name, b) Roll, c) Phnno, d) Address. Then design a derived class from above base class with member data as a) marks1, b) marks2, c) total (should not be inserted). Now display the result of n student consisting roll, name, total. Show ambiguity in inheritance and implement the method to avoid it. Implement containership. *Implement constructor inheritance.	Inheritance
S. No.	Specific problem(s) related with practical / Sessional work	Skill area
04	xvii) Write a program which reads a complex number. Now increment only the real part and display the same. xviii) Write down a program which reads a complex number. Now	Operator and function overloading

	decrement the real and imaginary part and display. xix) Implement both prefix and postfix operation on a complex number. xx) Overload arithmetical binary operators (+, -, *) for complex numbers. xxi) *Overload comparison operators (<, >, <=, >=, !=, ==) for two objects of same type. xxii) Write a program which converts one basic type to class type. xxiii) *Write a program which converts one class type to another class type. xxiv) *Implement friend function to access the data members from two different classes.	
05	xxv) *Write a program in C++ using pointer which calculate the sum of two complex numbers. xxvi) *Write a program to create a matrix using pointer in dynamic way (pointer to an array and array of pointers). xxvii) Uses of **this** pointer to access the content of an object.	Pointers
06	xxviii) Implement Compile time Polymorphism (early bindings) and run time Polymorphism (late bindings) using virtual function. xxix) Implement friend class using forward declaration to access the private data member of the other.	Polymorphism
07	xxx) Write a program which generates a template class, by which we can perform integer type data addition and float type data addition also. xxxi) *Use of function template with multiple parameters. xxxii) *Use of class template with multiple parameters. xxxiii) Write a program for division operation to handle an exception if the divisor is 0. xxxiv) *Write a program in C++ to handle multiple exceptions for different operational output.	Templates & exception Handling
08	xxxv) Use different modes of opening files to perform various operations on file. xxxvi) *Create a random file to insert, edit and delete operations using file pointers and manipulators. xxxvii) Write a program for reading and writing objects into a file.	I/O Operations on files through Stream

Text Books			
Name of the Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
SouravSahay	Object Oriented Programming with C++	Second Edition	Oxford
Robert Lafore	Object Oriented Programming in C++	Fourth Edition	Pearson
D Jana	Object Oriented Programming in C++		PHI
Venugopal	Mastering C++		TMH
RadhaGanesan	Creative Programming Skills in C++		Scitech
B Stroustrup	C++ programming Language	3rd Edition	Pearson
Bhushan Trivedi	Programming with Ansi C++	Second Edition	Oxford
M.T. Somashekhara, D.S.	Object Oriented		PHI

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Guru, H.S. Nagendraswamy, K.S. Manjunatha	Programming with C++		
E. Balgurusamy	Object oriented programming with C++		Tata McGraw Hill
Shukla	Object oriented programming in C++		Wiley
BALAGURUSAMY	Object Oriented Programming with C++		TMH
Miller	C++ for Artist		SPD
Dasgupta	C, C++ & C# Blackbook		Dreamtech
Khurana	Object oriented programming with C++		Vikas
Mahapatra	programming in C++		Schand
Subburaj	Object oriented programming in C++		Vikas
Sunil K Pandey	Thinking in C++	Seventh Edition	S. K. Kataria and Sons

Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

Websites:
- http://www.sourcecodesworld.com
- http://www.softeam.com
- http://www.cplus.about.com/od/beginnerctutorial

Demo lectures with power point presentations using LCD projector should be arranged to develop Programming concepts of students.

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Format for Syllabus

Name of the Course: Computer Graphics	
Course Code: CST/4/405	Semester: Fourth
Duration:16 weeks	Maximum Marks: 100 (Theory) + 50 (practical)
Teaching Scheme	Examination Scheme
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Assignment & Quiz: 10(Th.)+25(Pr) Marks
Practical: 2 hrs./week	End Semester Exam.: 70(Th)+25(Pr) Marks
Credit: 3+1	

Aim: To understand different aspects of computer graphics and use.	
Sl. No.	
1.	The chief aim of computer graphics is to display and print realistic-looking images
2.	Understand the principles of 3D computer graphics
3.	Develop programming skills for computer graphics Programming in C.

Objective: Student will be able to	
Sl. No.	
1.	To apply the algorithms to draw lines, circles and polygons.
2.	To use transformation techniques to scale, rotate and translate the object.
3.	To select the methods of enlarging visible portion of drawing.
4.	To develop the logic for drawing the natural objects using different algorithms for curved lines.
5.	To describe the fundamentals of raster graphics and interactive graphics.
6.	
7.	

Pre-Requisite:	
Sl. No.	
1.	Basic knowledge of C programming
2.	Basic data structure.
3.	Concept of mathematics.(Geometry, Matrix and other field).

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Contents (Theory)		Hrs./Unit	Marks
Unit: 1	**Basics of Computer Graphics** 1.1 Display devices, Primitive operations, 1.2 Text mode and graphics mode, graphics functions, Shapes, colors, Co-ordinate systems, 1.3 Applications of computer graphics 1.4 Raster scan display, Random scan display	6	
Unit: 2	**Line, circle, and polygon.** 2.1 Basic concepts in line drawing, 2.2 Line drawing algorithms: DDAalgorithms, Bresenham's algorithm Circle generating algorithm algorithm, 2.3 Bresenham's circle drawing algorithm, midpoint circle drawing algorithm. 2.4 Polygons – Types of polygons, Polygon representation, inside –outside test, 2.5 Polygon filling: Flood fill, scan-line algorithm.	13	
Unit: 3	**Transformations** 3.1 2D transformation: Translation, Rotation, scaling, Reflection, shearing, transformation matrices, Homogeneous co-ordinate system. 3.2 Rotation about an arbitrary point, scaling about fixed point. 3.3 Composite transformations. 3.4 3D Transformation: scaling, rotation, translation, rotation about arbitrary axis etc.	10	
Unit: 4	**Windowing & clipping** 4.1 Viewing transformation, Normalization transformation 4.2 Line clipping: Cohen-Sutherland Line clipping algorithm, midpoint subdivision algorithm 4.4 Polygon clipping: Sutherland – Hodgeman Polygon clipping algorithm.	06	
Unit: 5	**Curves** 5.1 Curve generation: Lagrange Interpolation curves, 5.2 B-Spline, Bezier curves.	07	
Unit: 6	**Projection** 6.1 Different Parallel projection 6.2 Perspective Projection.	03	
Total		**45**	
Text Books:			

Name of Authors	Title of the Book	Edition	Name of the Publisher
Hearn &Beakar	Computer Graphics through C	5th	Pearson
Maurya	Computer Graphics with Virtual Reality System		Wiley
Udit Agarwal	Computer Graphics		Katson books
Pakhira	Computer Graphics Multimedia & Animation	2nd	PHI

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Xiang &Plastock	Computer Graphics		McGraw Hill
VakaMurali Mohan	Computer Graphics		Scitech
Neeta Nain	Computer Graphics		Vikas
Chopra	Computer Graphics		S.Chand
Reference Books:			
Name of Authors	Title of the Book	Edition	Name of the Publisher
Kanetkar	Graphics under C		BPB
G.S.Baluja	Computer Graphics& Multimedia		DhanpatRai&CO
Suggested list of Laboratory Experiments:			

Practical

Practical:

Skills to be developed:

Intellectual skills:

- Use of programming language constructs in program implementation.
- To be able to apply different logics to solve given problem.
- To be able to write program using different implementations for the same problem
- Study different types of errors as syntax semantic, fatal, linker & logical
- Debugging of programs
- Understanding different steps to develop program such as

  · Problem definition

  · Analysis

  · Design of logic

  · Coding

  · Testing

  · Maintenance (Modifications, error corrections, making changes etc.)

Motor skills:

Proper handling of Computer System

List of Practical:

1) Implement DDA algorithm for line drawing

2) Implement Bresennham's algorithm for line drawing.

3) Implement Mid-point circle drawing algo.

4) Implement Bresennham's algorithm of circle drawing.

5) Implement Flood fill algorithm for Polygon filling.

6) Implement scan-line algorithm for polygon filling.

7) Write Program for 2-D transformations -> scaling, Rotation,

8) Write Program for 2 D transformations shearing and Translation program

9) Write and implement program for rotation about an arbitrary point.

10) Implement Cohen- Sutherland algorithm for line clipping.

11) Implement mid point subdivision algorithm for line clipping.

12) Implement Sutherland-Hodgeman algorithm for polygon clipping.

13) Write a program to draw a curve using Bezier's algorithm.

14) Write a program to draw curve using B spline.

** Any Graphics program can be done in laboratory (like animation, fractals etc.)

Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and**	

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must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks

Format for Syllabus

Name of the Course: WEB Page Development (Professional Practice - II)	
Course Code: CST/4/PP-II	**Semester:** FOURTH
Duration: Six months	**Maximum Marks: 50 (Practical)**
Teaching Scheme	**Examination Scheme**
Theory: nil	Mid Semester Exam: Nil
Tutorial: nil	Assignment & Quiz: Nil
Practical: 2 hrs./week	End Semester Exam: 50 Marks (Internal)
Credit: 2	

Aim:	
Sl. No.	
1.	To exploring your business worldwide and makes strong impact image using active online presences with web site. And well-designed and aesthetically appealing website can give you a strong advantage over other online competitors.
2.	To make an interesting to see graphic designers on one end, and web programmers on the other, arguing their respective positions active web page designing is today's need.
3.	To get strong instantaneous recognition of relevance which leads to clarity, and understanding at a glance a well crafted brand strategy which provides context and perspective, and a detailed website plan that spells out specific objectives, target audiences, paths to conversion and other critical elements of your site.

Objective:	
Sl. No.	Students will able to:
1.	Design simple Web pages - using HTML
2.	Organize information using Tables, collect information from users using forms & present information using Frames.
3.	Use style sheets to gain full control of formatting within Web page.
4.	Include ASP within Web pages.
5.	Embed multimedia to Web pages.
6.	Integrate all above to develop Web sites.

Pre-Requisite:	
Sl. No.	The student will be able to:
1.	Interaction with DOS / Windows Operating System.
2.	Ability to develop logic / flow of simple problem.
3.	Web page design tags of Markup language.

Contents	
Sl. No.	Skills to be developed

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1.	**Intellectual skills:**	
	➢ Develop web designing skills.	
	➢ Apply different logics to solve given problem.	
	➢ Write program using different interfaces.	
	➢ Understand client server architecture model and uses.	
	➢ Embedded programming tricks.	
	➢ Understanding different steps and stages to develop complex architecture of the WebPages	
2.	**Motor skills:**	
	➢ Proper handling of Computer System**.**	

D E T A I L   C O U R S E   C O N T E N T (Sessional / Practical)

Unit	Contents	Remarks
1	**INTERNET BASICS:** • Familiarity with internet browser (Internet Explorer, Netscape Navigator etc.) • Working with browser window tool bar , menu bar • Browsing a given web site address, searching a particular topic through search engines. • Familiarity with E-Mail, sending viewing printing e-mail message. • Use of mailbox (inbox, outbox) in outlook express. Use of attachment facility available in e-mailing.	
2	**WEB SERVER:** • Familiarity with web server – IIS, PWS etc. – Configuring web server – Creating virtual directory.	
3	**INTERNET SERVICES** • Concept and familiarity of various internet services (www, http, ftp, chat etc).	
4	**HTML/XML** • Creating simple HTML & XML file, place it in web server and access it from client Browser. • Creating a HTML form incorporating GUI components (Command button, text box, radio button, check box, combo box etc).	
5	**ACTIVE SERVER PAGES** • Introduction to Active Server Pages. • Elements of ASP (Scripts, Objects, Components). • Making your first Active Server Page.	
6	**INTRODUCING VB SCRIPT:** • Variables, Mathematical operators, functions — Logical operators, Loop, Conditional statements — String Function, Date and Time Function. • Subroutine — Formatting Display, Adding Components to scripts — Handling Event driven programming.	
7	**WORKING WITH ASP :** • Using HTTP — Writing simple ASP files — Controlling Execution of server side scripts.	

Unit	Contents	Remarks
	• Problems on HTML forms to get user information and retrieving HTML form contents • Working with query string.	

8	**ASP SESSION:**
	    • Introduction to session.
	    • Familiarity and working with session objects (simple problems).
	    • Using session events.
	    • Familiarity and working with cookies.	

9	**ASP APPLICATION**:
	    • Introduction to ASP Application features of ASP Application
	    • Creating a Simple ASP Application, Setting the properties of ASP Application — Using Application objects and Application events.	

Unit	**Contents**	**Remarks**

10	**ASP COMPONENTS:**
	    • Using Components in ASP (Simple problems) — Creating Components with page scope, session scope, Application scope.
	    • Working with browser capability component, file assess components , counter components etc.(Simple problems)	

11	**DATABASE MANAGEMENT THROUGH ASP:**
	    • Brief overview of ActiveX Data Objects.
	    • Using ADODB to access a database from ASP (Simple Problem) — Opening, closing database connection
	    • Executing SQL statements.	

A sample List of Practical / Sessional works to be done (Leading '*' denotes the harder problems)		
S. No.	**Specific problem(s) related with Practical / Sessional work**	**Skill area**
01	1.1. Create a static web pages using simple related tags like body with background colour, picture etc., align, font, br etc.	HTML
	1.2. Embed an image within the page using Src, height, width, border, align, alt etc.	
	1.3. Implement hyperlinking between two html pages.	
	1.4. Implement a table with size 4 X 4 on a page and insert some textual as well as numeric data into the cells. Use proper tags for alignment.	
	1.5. Create a Web page for the following: WELCOME TO XYZ COLLEGE OF ENGINEERING (scroll Horizontally) STUDENT DETAILS (Blink)	

S. No.	S. Name	BRANCH /SEM	Address	Marks		
				M1	M2	M3

	1.6. Implement frame to display multiple pages on screen.	
02	2.1. *Design Login form with validation.	HTML Forms with Scripts.
	2.2. *Design Registration form with validation of email address, date of birth, blank field, telephones and mobile numbers etc.	
	2.3. Design registration form of college using text box, text area, radio list, check list, button etc.	
03	3.1. Apply simple application VBscripts using variables, arrays etc.	VB Scripting Language
	3.2. Implement a VBprocedure Sub/ Function to display the area of a circle. Radius of the circle should be passed as a parameter to the procedure.	
	3.3.* Implement Loop(s) and conditional statement (s) to display all prime numbers between n1 to n2 integral values.	

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04	4.1. Create an application using ASP to customize a Web Page.	ASP and its interface with Database
	4.2. *Create a login page with user_id and password field that will check whether a user is valid or not. If the user is valid then Loginsuccess page will be displayed otherwise Loginunsuccess page will be generated.	
	4.3. *Create a short project regarding the maintenance of login page. It should detect an existing user, displays invalid user_id and/or password. Create a new user, update information of an existing user etc.	

Text Books:			
Name of Authors	Title of the Book	Edition	Name of the Publisher
Jackson	Web Technologies		Pearson
N.P. Gopalan, J. Akilandeswari	Web Technology, A developer's Perspective		PHI
Sebesta	Programming with World Wide Web, 4e		Pearson
GODBOLE	Web Technologies		TMH
Srinivasan	**Web Technology**		Pearson
Koggent Learning Solutions	Web Technology (including HTML,CSS,XML,ASP,JAVA) Black Book		Dreamtech
Aibra	HTML 5 for Beginners		SPD
Freeman	Head First HTML 5		SPD
Nagpal	Web Design technology		S.Chand
Uttam K Roy	Web Technologies		OXFORD
Ivan Bayross	Practical ASP		BPB
** During end semester examination all Lecturers should be present.			

Format for Syllabus

Name of the Course: SOFTWARE ENGINEERING

Course Code: CST/5/501	**Semester: Fifth**
Duration:	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
	Attendance, Assignment & Quiz: 10 Marks
	End Semester Exam.: 70 Marks
Credit: 3	

Aim:	
Sl. No.	
1.	To learn different software processes and models.
2.	To learn software testing methods.

Objective: Student will be able to	
Sl. No.	
1.	Plan & develop the frame work of project.
2.	Compare various project process models & use in project planning
3.	Use the principles of communication, planning, modeling construction & deployment
4.	Apply testing strategies & methods on software projects.
5.	Compare various testing methods.
6.	Identify the duties & responsibilities of People, team leader & stakeholders while planning the software project.
7.	Schedule the project according to time, size, shape, utility & application
8.	Monitor & manage the risk during the design of software project.
9.	Use the parameters of software quality assurance
10.	Calculate the cost of software, using cost estimation models such as COCOMO II.

Pre-Requisite:	
Sl. No.	
1.	Basic knowledge of computer is helpful.

Contents (Theory)		Hrs./Unit	Marks
Unit: 1 Name of the Topics: **Overview of Software Engineering & the Software Development Process**	1.1 The evolving Role of software & changing nature of software. 1.2 Software Engineering –A layered Technology approach. 1.3 A process framework & software project tracking & control. 1.4 The Capability Maturity Model Integration technique. 1.5 Process patterns, process Assessment, personal & Team Process models & Process Technology Theories. 1.6 Process Models –Waterfall, Incremental, RAD, Prototype, Spiral.	08	
Unit: 2	2.1 Software Engineering core principles, Communication,	13	

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Name of the Topics: **Software Engineering requirements & Development of Analysis & Design models.**	Planning, Modeling, Construction & Deployment principles. 2.2 Requirements Engineering Tasks, Initiating the requirement process. 2.3 Analysis approaches of software & preparation of Analysis model using Data modeling, Concepts, Object-oriented Analysis, Flow oriented model, Class-Based model, Behavioral Model. 2.4 Design approaches of software & preparation of design model using Design concepts, Design model, and pattern based design.		
Unit: 3 Name of the Topics: **Testing Strategies & Methods.**	3.1 Software Testing Fundamentals. 3.2 A Strategic approach to software testing. 3.3 Test Strategies for conventional software, Unit Testing, Integration Testing, Regression testing, smoke testing. 3.4 Validation testing using Alpha & beta testing, system testing using recovery, security, stress & performance testing. 3.5 Black Box & White Box Testing. 3.6 Debugging process strategies.	08	
Unit: 4 Name of the Topics: **Software Project Management**	4.1 The management spectrum – The people, The product, the process & the project. 4.2 Project scheduling – Basic concepts, relationship between people & effort, effort distribution, defining a task for the software project, Defining a task network & scheduling of project. 4.3 Risk Management – Reactive Vs Proactive risk strategies, software Risks, Risk Identification, Risk Projection & Risk refinement, monitoring & management. 4.4 Change Management – SCM scenario, SCM repository & process. 4.5 Formal method & clean room software development & management approach.	10	
Unit: 5 Name of the Topics: **Software Quality Management& Estimation**	5.1 Basic Quality Concepts. 5.2 Software Quality Assurance 5.3 Statistical software quality assurance, 5.4 Six sigma strategy. 5.5 Software Reliability 5.6 The ISO 9000 quality standards 5.7 McCall's quality factors. 5.8 Observations on estimation 5.9 The project Planning process ,software scope & feasibility ,Resources 5.10 Decomposition Techniques **5.11** COCOMO II model & the make / Buy design	06	
Total		**45**	

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Rajib Mall	Fundamental of Software Engineering		PHI
Bell	Software Engineering for Students, 4e		Pearson

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Roger S. Pressman	Software Engineering –A Practitioner's Approach		TMH
Sommerville	Software Engineering, 9e		Pearson
Pfleeger	Software Engineering: Theory and Practice, 4e		Pearson
Mishra/ Mohanty	Software Engineering		Pearson
Khurana	Software Engineering: Principles and Practices		Vikas
Rajani Kanta matul	Software Engineering		Scitech

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Aalam	Application Software Re-engineering		Pearson
James	Software Engineering		PHI

Note:

Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

Format for Syllabus

Name of the Course:Computer Engineering Group **(JAVA PROGRAMMING)**	
Course Code: CST/5/502	**Semester: FIFTH**
Duration:	**Maximum Marks:100+100 ()**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Assignment & Quiz: 10 Marks
Practical: 4 hrs./week	End Semester Exam.: 70 Marks
Credit: 3+2	**Practical 50(int) + 50(ext)**

Aim:

Sl. No.	
1.	To learn & understand various programming paradigms.
2.	To implement platform independent model.
3.	To increase robustness & Security of software.

Objective:

Sl. No.	Students will able to:
1.	· Design and implement classes and methods
2.	· Understand and implement basic programming constructs
3.	· Apply object oriented features to real time entities
4.	· Differentiate between primitive data types and class data types and implement conversion between them.

5.	· Understand and implement the concept of reusability and extensibility	
6.	· Create packages and interfaces and used it in programs	
7.	· Design and implement multithreaded programs	
8.	· Manage errors and exceptions	
9.	· Design and implement applet and graphics programming	
10.	· Make use of Data streams in programs	
11.	· Write programs by combining all features of Java.	

Pre-Requisite:		
Sl. No.		
1.	Basic of Object Oriented Programming	

Contents (Theory)		Hrs./Unit	Marks
Unit: 1	**Introduction to Java** 1.1 **Fundamentals of Object Oriented Programming** Object and Classes, Data abstraction and encapsulation,Inheritance, Polymorphism, Dynamic Binding 1.2 Java Features Compiled and Interpreted, Platform independent and portable, Object orientedDistributed, Multithreaded and interactive, High performance 1.3 Constant, Variables and Data TypesConstant, Data Types, Scope of variable, Symbolic Constant, Type casting, Standard default values 1.4 Operator and Expression Arithmetic Operators, Relational Operators, Logical Operators,Assignment Operator Increment and Decrement Operator, ConditionalOperator, Bit wise Operator, Special Operator 1.5 Decision making and Branching Decision making with if statement, Simple if statement, The if elsestatement, The else if ladder, The switch statement, The? : Operator 1.6 Decision making and LoopingThe While statement, The do statement, The for statement, Jumps in Loops, Labeled Loops	**08**	
Unit: 2	2.1 Classes, Object and Methods Defining a class, Creating object, Accessing class members, Constructor,Methods Overloading, Static Member 2.2 Inheritance Extending a Class (Defining a subclass Constructor,Multilevel inheritance, Hierarchical inheritance, Overriding Methods,Final variable and Methods, Final Classes, Abstract method and Classes 2.3 Visibility Control Public access, friend access, Protected access, Private access, PrivateProtected access 2.4 Array, Strings and Vectors Arrays, One Dimensional array, Creating an array, Two	**08**	

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	Dimensionalarray, Strings, Vectors, Wrapper Classes		
Unit: 3	**Interfaces and Packages** 3.1 Interface: Multiple Inheritance Defining interfaces, Extending interfaces, Implementing interfaces,Accessing Interface variable 3.2 Packages: Putting Classes Together System Package, Using system Package, Naming Convention, CreatingPackage, Accessing a package, Using a package, adding a class to apackage	**06**	
Unit: 4	**Multithreaded Programming and Exception handling** 4.1 Multi Threading: Creating Thread, Extending a thread class, Stopping and Blocking athread, Life cycle of thread, Using thread method, Thread exceptions,Thread priority, Synchronization, Implementing a 'Runnable'' Interface. 4.2 Managing Errors and Exceptions Types of errors, Exception, Multiple catch statement, using finallystatement, Using Exception for Debugging	06	
Unit: 5	**Java Applets and Graphics Programming** 5.1 Applet Programming Local and remote applets, How applet differ from application, Preparing to write applets, Building applet code, Applet life cycle,Creating an Executable Applet, Designing a Web page, Applet tag,Adding Applet to HTML file, Running the Applet, Passing parameter to applet 5.2 Graphics Programming The Graphics Class, Lines and rectangle, Circle and Ellipse, DrawingArcs, Drawing Polygons, Line Graphs, Using control loops in Applets,Drawing Bar charts	06	
Unit: 6	**Streams and File I/O** 6.1 Stream Classes 6.2 Character Stream, Byte Stream 6.3 Serialization	05	
Unit: 7	DATA BASE CONNECTIVITY : JDBC i *Java Data Base Client/ Server* 3.1 Java as a Database front end Database client/server methodology Two-Tier Database Design Three-Tier Database Design *3.2 The JDBC API* The API Components, Limitations Using JDBC(Applications vs. Applets), Security Considerations, A JDBC Database ExampleJDBC Drivers ,JDBC-ODBC Bridge Current JDBC Drivers	**06**	
	Total	45	
	Contents (Practical)		
Sl. No.	Skills to be developed		
1.	**Practical:** Skills to be developed:		

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	Intellectual skills:
	· Use of programming language constructs in program implementation.
	· To be able to apply different logics to solve given problem.
	· To be able to write program using different implementations for the same problem
	· Study different types of errors as syntax semantic, fatal, linker & logical
	· Debugging of programs
	· Understanding different steps to develop program such as
	· Problem definition
	· Analysis
	· Design of logic
	· Coding
	· Testing
	· Maintenance (Modifications, error corrections, making changes etc.)
2.	Motor Skills:· Proper handling of Computer System.

List of Practical:

LIST OF SAMPLE PROBLEMS FOR DATA STRUCTURE LAB(for example)

Write simple programs based on basic syntactical constructs of Java like:

a) Operators and expressions.

b) Looping statements.

c) Decision making statements.

d) Type casting.

2. Write a simple Java program to demonstrate use of command line arguments in Java..

3. Write a Java Program to define a class, describe its constructor, overload the constructors and instantiate its object

4. Write a Java Program to define a class, define instance methods for setting and retrieving values of instance variables and instantiate its object

5. Write a Java Program to define a class, define instance methods and overload them and use them for dynamic method invocation.

6. Write a Java Program to demonstrate use of sub class

7. Write a Java Program to demonstrate use of nested class.

8.Write a Java Program to practice

- use of single Dimensional array.

- use of multidimensional array.

9. Write a Java Program to implement array of objects.

10.Write a Java program to practice

- using String class and its methods.

- using String Buffer class and its methods.

11. Write a Java Program to implement Vector class and its methods.

12. Write a Java Program to implement Wrapper classes and their methods.

13. Write a Java Program to implement single inheritance by applying various access controls to its data members and methods.

14. Write a Java Program to implement multilevel inheritance by applying various access controls to its data members and methods.

15. Write a Java Program to implement inheritance and demonstrate use of method overriding.

16.Write a program to demonstrate

- Use of implementing interfaces.

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- Use of extending interfaces.
17. Write a Java program to implement the concept of importing classes from user defined package and creating packages.
18. Write a program to implement the concept of threading.
19.Write a program to implement the concept of Exception Handling
- using predefined exception.
- by creating user defined exceptions.
20.Write a program to implement the concept of Synchronization for
- object synchronization.
- Method synchronization.
21.Write a program using Applet
- To display a message in the Applet.
- For configuring Applets by passing parameters.
22.Write programs for using Graphics class
- To display basic shapes and fill them.
- draw different items using basic shapes
- set background and foreground colours.
23. Write program to demonstrate use of I/O streams.
24. 14 Write an Application program /Applet to make connectivity with database using JDBC API.
25. Write an Application program/Applet to send queries through JDBC bridge & handle result.

_____

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Ivor Horton's	Beginning Java	7th	Wiley India
Gaddis	Starting Out with Java: From Control Structures through Objects, 4e		Pearson
Debasish Jana	Java and Object Oriented Programming Paradigm		PHI
Horstmann, Cornell	Core Java Vol I		PEARSON
Mahesh P.Matha	Core Java		PHI
Liang	Introduction to Java Programming, 7e		Pearson
Deitel	Java for Programmers		PEARSON
Pandey	**Java Programming**		Pearson
Rao	**Core Java**		Dreamtech
Herbert Schildt	JAVA 2: The Complete Reference		TMH
Murach	Murach's Java Programming		SPD
Mercy Rani	**FAQ's in JAVA**		Scitech
Rakshit	**HandBook of OOP with JAVA**		Schand

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Khandare	Programming in Java		Schand
Malhotra, Choudhary	Programming in Java		OXFORD
Knoernschild	Java Application Architecture: Modularity Patterns with Examples Using OSGi, 1/e		PEARSON
Liang	Introduction to Java Programming, Comprehensive Version, 7e		PEARSON
Rashmi Kanta Das	Basic Java		SCITECH

Suggested list of Laboratory Experiments:

Sl. No.	Laboratory Experiments

1.	java program to perform garbage collection
2.	Java Program to get IP Address
3.	Write a programm for stopwatch.

Suggested list of Assignments / Tutorial:

Sl. No.	Topic on which tutorial is to be conducted
1.	What are Hash Code and equals in Java?
2.	When to use Comparator and Comparable Interface in java?
3.	How to create an immutable class?

Note:

Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**
2.	Question Paper setting tips

Format for Syllabus

Name of the Course: Computer Engineering Group **(OPERATING SYSTEM)**	
Course Code: CST/5/503	Semester: FIFTH
Duration:	Maximum Marks:100 + 50
Teaching Scheme	Examination Scheme
Theory: 3 hrs./week	Mid Semester Exam.:20 Marks
Tutorial: hrs./week	Assignment & Quiz: 10 Marks
Practical: 2 hrs./week	End Semester Exam.: 70 Marks
Credit: 3+1	Practical 25(int) + 25(ext)

Aim:

Sl. No.	
1.	To learn Basic concepts of operating systems.
2.	To learn in detail different types of OS.
3.	To learn all functionalities of OS in detail.

Objective:

Sl. No.	Students will able to:
1.	· Learn the various milestones in the history of operating system and the modern trends in operating system.
2.	· Understand the features and functions of operating systems provided by various system calls.
3.	· Understand a process, deadlock & the concept of context switching & multiprogramming.
4.	· Learn various memory management and file management techniques.
5.	· Understand the tools and the components of the operating system.
6.	· Implement various algorithms of scheduling.
7.	· Compare and contrast the various standard solutions to operating system problems.
8.	· Make best use of facilities that computer systems offer them for solving problems.
9.	· Understand the UNIX vi editor and Unix utilities.

Pre-Requisite:			
Sl. No.			
1.	Handling of Windows OS.		
Contents (Theory)		Hrs./Unit	Marks
Unit: 1	**Introduction** 1.1 Operating system, Evolution, Generations –1st, 2nd, 3rd, 4th. 1.2 Mainframe Systems – Batch, Multi programmed, Multitasking, Time sharing, Desktop. 1.3 Multiprocessor Systems 1.4 Distributed Systems. 1.5 Clustered Systems. 1.6 Real Time Systems. 1.7 Special-Purpose Systems 1.8 Open-Source Operating System	**04**	
Unit: 2	**Operating System Structures** 2.1 System components - Process management, Main memory management, File Management, I/O system management, Secondary storage management. 2.2 Operating system services. 2.3 System calls – Uses, process control, file management, Device management, Information Maintenance, communication**.** 2.4 Operating system structure. Simple structure, layered, monolithic, microkernel. 2.5 Booting 2.6 Virtual Machine	**02**	
Unit: 3	Process Management 3.1 Processes - Concept, process, state, process Control block. 3.2 Process scheduling - Scheduling queues, Scheduler, context switch. 3.3 Operations on processes - creation, termination. 3.4 Inter process communication. Classical problems of synchronization, semaphores. 3.5 Threads - Benefits, user and kernel threads. 3.6 Multithreading Models - Many to one, one to one, many to many.	**06**	
Unit: 4	Scheduling 4.1 Scheduling – Objectives, concept, criteria, CPU and I/O burst cycle. 4.2 Types of Scheduling-Pre-emptive, Non pre-emptive. 4.3 Scheduling Algorithms. First come first served (FCFS), Shortest job first (SJF), Round Robin (RR), Priority. 4.4 Other Scheduling. Multilevel, Multiprocessor, real-time. 4.5 Deadlock. System model, principle necessary conditions, mutual exclusion, critical region.	04	

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	4.6 Deadlock handling. Prevention and avoidance.		
Unit: 5	**File System and Memory Management** 5.1 File- Concept, Attributes, Operations, Types, Structure 5.2 Access Methods – Sequential, Direct. 5.3 Swapping 5.4 Allocation Methods – Contiguous, Linked, Indexed. 5.5 Directory Structure – Single level, Two level, Tree Structure. 5.6 Protection –Types of accesses, Access control. 5.7 Basic Memory Management –Partitioning, Fixed & Variable. 5.8 Free Space management techniques – Bitmap ,Linked List. 5.9 Virtual Memory – Concept ,Paging, Page fault ,Page Table. 5.10 Page Replacement algorithms – FIFO(First in First out) ,Optimal Page replacement, LRU (Least recently used),NRU (Not recently used)	08	
Unit: 6	**I/O Management** I/O hardware, polling, interrupts, DMA, application I/O interface (block and character devices, network devices, clocks and timers, blocking and nonblocking I/O), kernel I/O subsystem (scheduling,buffering, caching, spooling and device reservation, error handling), performance.	08	
Unit: 7	**Disk Management** disk structure, disk scheduling (FCFS, SSTF, SCAN,C-SCAN) , disk reliability, disk formatting, boot block, bad blocks.	**06**	
Unit: 8	**Case Studies** 8.1 General overview of Unix System System Structure, Operating System Structure 8.2 Introduction to kernel Kernel data structure, System Administration 8.3 Internal Representation of Files I nodes, Structureof regular file, Super block		
Total		**15**	
Contents (Practical)			
Sl. No.	Skills to be developed		
1.	**Practical:** Skills to be developed: Intellectual skills: · Understanding syntax of commands · Interpretation of commands · Execution of commands ·		

	Motor skills:
	· Proper handling of Computer System**.**
	List of Practical:
	1) Identify the major desktop components, interfaces and their functions .Differentiate the various Windows
	Operating system.(Windows 9x,Windows NT, Windows 2000& Windows XP.
	2) **Use of file and directory manipulation commands** – ls, rm, my, cp, join, split, cat, head, tail, touch, diff,
	comm., pr, chmod, mkdir, rmdir, cd, pwd, dir, cmp.
	3) Use of text processing and communication commands – tr, wc, cut, paste, spell, sort, grep, msg, talk, wall,
	write, who, who am i ,news, mail.
	4) Use of general purpose and process commands- ps, wait, sleep, exit, kill, bc, date, time, cal, clear, banner, tty, script, su, man.
	5) Use of vi editor & perform all editor commands.
	Study of:
	SHELL PROGRAMMING
	i) Shell Script
	ii) System variables & shell variables.
	iii) Shell termination.
	iv) Looping statements; conditional statements; case statements.
	v) Logical operators, Mathematical expression.
	vi) Command line parameters – Positional parameters.
	vii) String handling.
	6) Write and execute shell script to display the following output.
	i) Menu:
	a) List of files.
	b) Processes of user.
	c) Todays date
	d) Users of the system
	e) Quit to Unix
	ii) To check every argument and carry out the following.
	a) Argument is a directory, then display the number of files and directories present in that directory.
	b) If argument is a file, then display the size of file.
	c) If argument does not exist then create the directory.
	7) Write and execute the programme to implement round robin scheduling Algorithm.
	Study of:
	SYSTEM ADMINISTRATION
	i) Adding & Modifying Users accounts, Controlling Password.
	ii) Creating & Mounting File System.
	iii) init process &inittabstartup files, Run levels.
	iv) Managing Disk Space(df , du , cpio)
	v) Searching Files with find command
	vi) Using ftp protocol to move files between computers.
	vii) 'Shutdown' command.
2.	Motor Skills:· Proper handling of Computer System**.**

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Silberschatz	Operating System Concepts	8th	Wiley

Galvin, Gagne			
Andrew S. Tanenbaum	Modern Operating Systems		PHI
Deitel	Operating System, 3e		PEARSON
Achyut S. Godbole	Operating Systems		Tata McGraw-Hill
R.Chopra	Operating System		S.Chand
Maurice J. Bach	The design of the Unix Operating System		PHI
B.M.Harwani	Unix and Shell Programming		OXFORD
Subhash	UNIX System Programming		PEARSON
Sobell	**Practical Guide to Linux Commands, Editors, and Shell Programming, 3/e**		PEARSON
P.B.Prasad	Operating Systems		Scitech
Khurana	Operating Systems		Vikas

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Tanenbaum	Operating Systems: Design and Implementation, 3rd ed.		pHI
Bhatt	Introduction to Operating Systems, An: Concepts and Practice, 4th ed.		pHI
Chandra mohan	Operating system		pHI
Stallings	Operating Systems 6e (Two Color Edition)		PEARSON
Ramasatish	Unix Programming		Scitech

Suggested list of Laboratory Experiments:

Sl. No.	Laboratory Experiments
1.	Installing windows OS.
2.	Introduction to Linux OS.
3.	C programs in VI editor on linux OS.

Suggested list of Assignments / Tutorial:

Sl. No.	Topic on which tutorial is to be conducted
1.	Solve examples by FCFS and draw gantt chart.
2.	Solve examples by SJF and draw gantt chart.
3.	Solve examples by RR and Priority draw gantt chart.

Note:

Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**
2.	Question Paper setting tips

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Format for Syllabus

Name of the Course: Theory of Computation	
Course Code: CST/5/504	**Semester: FIFTH**
Duration:	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Attendance, Assignment & Quiz: 10 Marks
	End Semester Exam.: 70 Marks
Credit: 3	

Aim:	
Sl. No.	
1.	Students through this paper will enhance their knowledge in mathematical models of programming languages, computers and capability of a computer.

Objective: Student will be able to	
Sl. No.	
1.	UnderstandAutomata
2.	Able to convert NFA to DFA and vice-versa.
3.	To understand Regular Expression
4.	To understand PDA
5.	To Know Turing Machine and its working principle.

Pre-Requisite:	
Sl. No.	
1.	Basic knowledge of Set theory, graph, tree and relation is helpful.
2.	
3.	

Contents (Theory)		Hrs./Unit	Marks
Unit: 1 Name of the Topics: **Introduction to Theory of Computation**	1.1 Definition of Languages 1.2 Definition of Grammars 1.3 Definition of Automata 1.4 Some applications	4	
Unit: 2 Name of the Topics: **Finite Automata**	2.1 Definition of an Automaton, Definition of finite Automaton, Block diagram of finite Automaton, Transition system, Properties of Transition Functions, Acceptability of a string by Finite Automaton. 2.2 Definition of DFA and NDFA, The equivalence of DFA and NDFA, A theorem on equivalence of DFA and	10	

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	NDFA. (Including Applications) 2.3 Mealy and Moore machine, Procedure for Transforming a Mealy Machine into a Moore Machine (with applications), Procedure for Transforming a Moore Machine to a Mealy Machine (with applications).		
Unit: 3 Name of the Topics: **Regular Expressions**	3.1 Definition of Regular expression and regular set, Identities of regular expressions, Arden's theorem (statement & application) 3.2 Relation between regular expression and finite automata, Transition system containing /\-mores (application), Conversion of Non-deterministic systems to deterministic system (application), Construction of finite automata equivalent to a regular expression (with application), Equivalence of two finite automata (application), Equivalence of two regular expressions; Pumping lemma (Statement & application), Closure properties of regular sets, Construction of regular grammar for a given DFA and a transition system for a given regular grammar G.	10	
Unit: 4 Name of the Topics: **Context free Languages**	4.1 Context free Grammars, Example of context free Languages and grammars, Leftmost and rightmost derivation, Derivation tree 4.2 Ambiguity in Context free Grammar and Parse tree, Removal of ambiguity 4.3 Simplification of Context free grammar, Removal of Useless symbols, Removal of Unit production, Removal of ε-Production. 4.4 Chomsky normal form and Greibach normal form.	10	
Unit: 5 Name of the Topics: **Push Down Automata**	5.1 Definition of a Pushdown Automaton 5.2 Two types of acceptance by PDA 5.3 Correspondence between PDA and Context Free Language – PDA corresponding to a given CFG – CFG corresponding to a given PDA – Only Concept of Deterministic PDA and Deterministic CFL.	6	
Unit: 6 Name of the Topics: **Turing Machine**	6.1 Structure and working of a simple Turing Machine. 6.2 Instantaneous description of Turing Machine 6.3 Turing Machine as Language accepter 6.4 Universal Turing Machine.	5	
Total		**45**	

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Kulkarni	Theory of Computation		Oxford
Mishra & Chandrasekaran	Theory of Computer Science (Automata, Languages and Computation)3rd ed.		PHI
Hopcroft	**Introduction to Automata Theory, Languages, and Computation, 3e**		**Pearson**
Kandar	**Introduction to Automata Theory, Formal Languages and Computation**		Pearson

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Anami	Formal Languages & Automata Theory		Wiley
Mahesh	Theory of Computation		Wiley
KUMAR	Theory of Automata Languages & Computation		TMH
Kinber	Theory of Computing: A Gentle Introduction		Pearson
Krithivasan	Introduction to Formal Languages, Automata Theory and Computation		Pearson
Moret	The Theory of Computation		Pearson
Agarwal	The Theory of Computation		Vikas
C. Froberg	Introduction to Numerical Analysis		Addison Wesley

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Nagpal	**Formal Language and Automata Theory**		Oxford
Biswas, Chakraborty	**Formal Language and Automata Theory**		JBBL

Note:

Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

Format for Syllabus

Name of the Course: Computer Engineering Group **(Network Management and Administration(Elective-I))**

Course Code: CST/5/505(I)	Semester: FIFTH	
Duration:	**Maximum Marks: 100 + 50**	
Teaching Scheme	**Examination Scheme**	
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks	
Tutorial: hrs./week	Assignment & Quiz: 10 Marks	
Practical: 3 hrs./week	End Semester Exam.: 70 Marks	
Credit: 3+2	**Practical 25(int) + 25(ext)**	

Aim:		
Sl. No.		
1.	Introduction to computer network	
2.	Introduction to network management and Administration	
3.	Introduction to network faults and troubleshooting	

Objective:		
Sl. No.	Students will able to:	
1.	· Compare different types of network.	
2.	· Describe the different types of network directory services.	
3.	· Design the computer network.	
4.	· Design the computer network.	
5.	· Know the network management and administration.	
6.	· Apply the different types of network technologies for internet connection.	
7.	· Troubleshoot and repair the network faults	
8.	· Make best use of facilities that computer systems offer them for solving problems.	

Pre-Requisite:		
Sl. No.		
1.	Handling of Windows OS.	
2.	Basic concept of computer network.	
3.	Basic knowledge of network management and Administration.	
4.	Basic knowledge of network faults and troubleshooting.	

Contents (Theory)		Hrs./Unit	Marks
Unit: 1	**1.1 Duties of the System Administrator** Linux as well as other OS Administrator, Steps of Installing and Configuring Servers. 1.2 Planning the Network – describing the Topologies, planning and Implementing the Security. 1.3 Steps of Kick-start Installation- Installing the kickstart Configurator, Boot Loader Option Screen, Partition, Network Configuration, Authentication, Firewall Configuration, Creating a Bootable CD-ROM. 1.4 System Start-up and Shutdown- Examining the Boot Process, Boot Loader, The kernel	**08**	

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	1.5. The File system- Understanding the file System Structure, Different OS Supported File Systems. 1.6 Examining the System Configuration Files		
Unit: 2	Network Services: 2.1 Managing the X Window System – Configuring the X Server with the X Configuration Tool, Manually Configuring X Server 2.2 Configuring Printer 2.3 TCP/IP Networking – Understanding Network Class, Configuring the Network, Exploring Directory Services and Remote Network Access. 2.4 The Network File System – NFS overview, Configure an NFS Server, Configure an NFS Client, NFS Security. 2.5 Network Related Jobs – Network Administrator, Network Engineer, Network Architecture / Designer, Other Network Related Jobs. 2.6 Directory Services - Define Directory Services, Definition of Novelle Directory, Windows NT domains, Microsoft's Active Directory, X500 Directory Access Protocol, Lightweight Directory Access Protocol, Forests, Trees, Roots and Leaves. Configuring Samba Server, 2.7 Active Directory Architecture – Object Types, Object Naming, Canonical Names, LDAP Notation, Globally unique identifiers, User Principle Names, Domain, Trees & Forests. 2.8 Remote Network Access – Need of Remote Network Access, Public Switched Telephone Network, Integrated Services Digital Network, Digital Subscriber Line, CATV. 2.9 Virtual Private Network – VPN Protocols, Types of VPNs, VPN Clients, SSL VPNs.	**08**	
Unit 3	Network Connection and Printing Services 3.1 Dynamic Host Configuration Protocol (DHCP) – DHCP Origins, Reverse Address Resolution Protocol (RARP), The Bootstrap Protocol (BOOTP), DHCP Objectives, IP Address Assignment, DHCP Architecture. 3.2 Introduction to Domain Name System(DNS) - DNS Objectives, Domain Naming, Top Level Domains, Second Level Domains, Sub domains, DNS Functions, Resource Records, DNS Name Resolution, Resolves, DNS Requests, Root Name Servers, Resolving a Domain Name, DNS Name Registration. 3.3 Understand Network Printing Concepts - Understand Network Printing Concepts, Locally connected print devices, Setting up local print devices, Shared print devices, Sharing Locally Attached Print Devices, Describe Windows Network Printing, and Add Print Wizard.	**08**	
Unit: 4	Implementation of Network 4.1 Designing Network – Accessing Network Needs, Applications, Users, Network Services, Security and Safety, Growth and Capacity Planning, Meeting Network	**06**	

	Needs – Choosing Network Type, Choosing Network Structure, Choosing Servers. 4.2 Configuring a Database Server 4.3 Creating VNC Server 4.4 Providing Additional Network Services – Configuring a Time Server, Providing a Caching Proxy Server. 4.5 Optimizing Network Services		
Unit: 5	Administering Windows 2000 Server (The Basics) 5.1 Working With User Accounts - Adding a User, Modifying User Account, Deleting or Disabling a User Account. 5.2 Working With Windows 2000 Security Groups – Creating Group, Maintaining Group Membership. 5.3 Working with Shares – Understanding Share Security, Cresting Shares, Mapping Drives 5.4 Administering Printer Shares – Setting up Network Printer, 5.3 Working with Windows 2000 Backup – Using Windows 2000 Servers Backup Software	05	
Unit : 6	System Administration 6.1 Keeping Your System Updated with up2date and Red Hat Network. 6.2 Updating and Customizing the Kernel 6.3 Configuring the System at the Command Line 6.4 Administering Users and Groups	05	
Unit: 7	Troubleshooting and security of Network 7.1 Understanding the Problem – Troubleshooting, Segmenting the Problem, Isolating the Problem, Setting Priorities. 7.2 Troubleshooting Tools – Hardware Tools, Software Tools, Monitoring and Troubleshooting Tools 7.3 Internal Security – Account Security, File and Directory permissions, Practices and user education. 7.4 External Threats – Front Door threats, Back Door threats, Denial services threats, Viruses, worms and other Malicious codes.	05	
Total		**45**	

	Contents (Practical)	
Sl. No.	Skills to be developed	
1.	**Practical:** Skills to be developed: Intellectual skills: · Fault finding of network · Troubleshooting of network · Proper installation of network	
2.	Motor Skills:· Proper handling of Computer System**.**	

List of Practical:

Practical Name
1 Creating Windows 2003/2008 Server/Linux Boot Disk.

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2 Installing Windows 2003/2008 Server/Linux

3 Installing Active Directory

4 Creating AD Objects

5 Setting up Local Print Device

6 Installing and Configuring a Network – Capable Print Device

7 Create new Users & give the Permission

8 Group of four students prepare a mini report on Latest Networking Technology.

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Collings and Wall	Red hat Linux Networking & System Administration		Wiley
Burke	**Network Management**		**PEARSON**
Subramania	**Network Management, 2e**		**PEARSON**
Sing	Network security and Management		PHI
Kirch & Dawson	Linux Network Administrator's Guide		SPD

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Microsoft Press	Networking + Certification Training Kit		
Sharma	Information Security and Cyber Laws		Vikas

Suggested list of Laboratory Experiments:

Sl. No.	Laboratory Experiments
1.	Basic TCP/IP utilities and commands. (eg: ping, ifconfig, tracert, arp, tcpdump, whois, host, netsat, nslookup, ftp, telnet etc...)
2.	Configure a router (Ethernet & Serial Interface) using router commands including access lists on any network simulator (eg. packet Tracer)
3.	Network design and implementation for small network using actual physical components with IP address scheme
4.	

Suggested list of Assignments / Tutorial:

Sl. No.	Topic on which tutorial is to be conducted
1.	Configuration of any three of the following of for each student a) Remote Login Service – TELNET/SSH b) Configuration of FTP server and accessing it via FTP Client.
2.	Installation of NS-2. Test network animation on Network Simulator2 (NS2).
3.	Configuration of any three of the following of for each student a) Remote Login Service – TELNET/SSH b) Configuration of FTP server and accessing it via FTP Client.

Note:

Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

Format for Syllabus

Name of the Course: ELECTIVE I (MULTIMEDIA AND ANIMATION TECHNIQUE)

Course Code: CST/5/505(II)	Semester: Fifth
Duration:	Maximum Marks: 100 + 50
Teaching Scheme	Examination Scheme
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Attendance, Assignment & Quiz: 10 Marks
Practical: 3 Hrs./week	End Semester Exam.: 70 Marks
Credit: 3+2	Practical: 25(INT)+25(EXT)

Aim:

Sl. No.	
1.	To combine moving images, graphics, text, and sound in meaningful ways is one of most powerful aspects of computer technology and which is multimedia and animation.
2.	To accessing data, allowing one to display video, animation, graphics, drawings, documents, and still images as needed during a presentation.
3.	To understand memory system and access mechanism of IO devices. To create visually compelling and technically accurate presentations for industrial and legal applications.

Objective: Student will be able to

Sl. No.	
1.	Import, Export Images.
2.	Edit Images.
3.	Create Animation.
4.	Build Flash Movie.
5.	Integrate Audio & Video.
6.	Build Text-Based Animation.
7.	Play Movie.
8.	Integrate Multimedia In Web Page.

Pre-Requisite:

Sl. No.	
1.	Basic knowledge of computer is helpful.
2.	Basic knowledge of image and graphics is helpful.
3.	

Contents (Theory)		Hrs./Unit	Marks
Unit: 1 Name of the Topics: Basics of Multimedia	1.1 Concept of Multimedia. 1.2 Multimedia data stream. 1.3 Hardware & Software requirement. 1.4 Application of Multimedia. 1.5 Steps of creating Multimedia presentation. 1.6 Concept of Hypermedia and Hypertext.	4	
Unit: 2 Name of the Topics: **Digital Audio & MIDI file format**	2.1 Audio sampling 2.2 Recording digital audio. 2.3 Audio standards for Multimedia applications. 2.4 MIDI file format. 2.5 MIDI event commands, meta-event & Messages. 2.6 MIDI hardware & Software.	5	
Unit: 3 Name of the Topics:	3.1 CODEC 3.2 Types of Compression.	13	

Image and Video Compression	3.3 Lossless/Statistical Compression techniques. 3.4 GIF image coding standard. 3.5 Lossy/Perceptual Compression techniques. 3.6 JPEG image coding steps. 3.7 MPEG Compression basics. 3.8 MPEG-1 Audio & Video. 3.9 MPEG-2 Audio & Video. 3.10 Concept of MPEG-4.		
Unit: 4 Name of the Topics: **Image File Format Details.**	4.1 BMP File Format 4.2 GIF File Format 4.3 JPEG File Format 4.4 TIFF File Format.	6	

Unit: 5
Name of the Topics:
Animation Techniques
	5.1 Definition of Animation.
	5.2 Types of Animation.
	    • Cell Animation
	    • Path Animation
	    • 2D vs. 3D Animation
	5.3 Computer assisted Animation
	5.4 Techniques of Animation
	    • Onion skinning
	    • Motion cycling
	    • Masking
	    • Color cycling
	    • Morphing
	5.5 Camera effects
	    • Camera Location
	    • Camera movement
	    • Zones of vision
	5.6 Special effects
	5.7 Methods of controlling the Animation.
	    • Procedural Animation
	    • Tracking live action
	    • Kinematics of controlling Animation
	    • Tweening, Morphing, Warping, Color dissolve
	5.8 Animation Software.
		12	

Unit: 6 Name of the Topics: **Virtual Reality**	6.1 Immersive and Non-immersive Virtual Reality 6.2 Application of Virtual Reality 6.3 Concept of VRML 6.4 Conceptual Architecture of VRML 6.5 Visualization aspect 6.6 Base technologies used in Implementation 6.7 Navigation.	05	
Total		**45**	

Comment [W1]:

Practical:

Practical Content:
All of the experiment shall be performed using PHOTOSHOP, MS-Flash or 3D-MAX or MAYA.
List of Experiments:
Photoshop
1. Use of different tools of Photoshop
2. Use of Colour tool of Photoshop
3. Use of blending modes of Photoshop
4. Learn Toning Tool, Different Media, Colour models.
5. Use of different effects of Photoshop

6. Use of Layers, Masks, Filters of Photoshop.
7. Use of Adding Actions in Photoshop

Flash/3D Max/Maya

1. Create a cycle & name each part of cycle using different styles & format & animate text.
2. Draw seed & create small plant with use of at least 4 frames.
3. Create a forest of tree with flowers & fruits from a small plant using different layers & frame transition time.
4. Create a forest of trees using the object created earlier. Also add lighting and rain effect.
5. Insert audio to relevant frames that has lighting & rain effect.
6. Convert created work into file format which can be publish on web.
7. Interfacing digital-web-cam, capturing live image & editing using web-cam software.
8. Importing & exporting images, apply different image editing tools.
9. Mini Project: Students should create a movie of minimum 2 minutes playtime using either Flash or 3D-MAX or MAYA software.

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Ranjan Parekh	Principles of Multimedia		TMH
Buford	Multimedia Systems		Pearson
Jeffcoate	Multimedia in Practice		Pearson
M.K. Pakhira	Computer Graphics Multimedia and Animation		PHI
Steinmetz	Multimedia: Computing, Communications & Applications		Pearson

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Sherawat, Sharma	Multimedia and Application		Katson
Mukhopadhyay, Chattopadhayay	Introduction to Computer Graphics & Multimedia		Vikas

Note:

Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

Format for Syllabus

Name of the Course:ADVANCED MICROPROCESSOR (ELECTIVE-I)	
Course Code: CST/5/503(III)	Semester: Fifth
Duration:	Maximum Marks: 100 + 50
Teaching Scheme	Examination Scheme

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Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Attendance, Assignment & Quiz: 10 Marks
Practical: 3 Hrs./week	End Semester Exam.: 70 Marks
Credit: 3+2	Practical: 25(INT)+25(EXT)

Aim:

Sl. No.	
1.	To study architectures and addressing modes of 16-bit & 32-bit microprocessors.
2.	To study different MS-DOS functions for Interrupts handling.
3.	To introduce Intel's superscalar architecture.

Objective: Student will be able to

Sl. No.	
1.	Explain architecture and memory management of 80286.
2.	Explain concepts of multitasking
3.	Know architecture and memory management of 80386.
4.	State the concept of paging
5.	Describe features and architecture of 80486, Pentium.
6.	Programming in assembly using different functions of DOS & BIOS interrupts.

Pre-Requisite:

Sl. No.	
1.	Basic knowledge of 8086 and its programming is helpful.
2.	Basic knowledge DOS interrupt is helpful.

Contents (Theory)		Hrs./Unit	Marks
Unit: 1 Name of the Topics: **16-bit Microprocessor - Intel 80286.**	1.1 Salient features, Internal architecture, Register organization (General purpose register, segment register, status and control register, instruction pointer, segment descriptor cache register) 1.2 Addressing mode such as Real, Protected Virtual Addressing mode, Selector, Descriptors and its types, LDT, GDT, IDT, privilege protections and task switching. 1.3 Operations of 80286 in Real and PVAM.	12	
Unit: 2 Name of the Topics: **32-bit Microprocessor –Intel 80386.**	2.1 Salient features, internal architecture, Register organization (General purpose register, segment register, status and control register, instruction pointer. Segment descriptor cache register. System address register LDTR & GDTR, TR, Debug register, Test registers, Control register. 2.2 Modes of 80386: Real, PVAM, paging, virtual 8086. Address translation in real, PVAM, paging.	12	
Unit: 3 Name of the Topics: **Interrupts of X86 microprocessor:**	3.1 Introduction to X86 interrupts (Hardware, software and exceptions), Interrupt vector table, Interrupt processing sequence. Hardware or exception interrupts (Singles step, divide by zero/overflow, non-maskable, breakpoint, overflow) software interrupts (INT, INTO instructions) 3.2 Introduction to MS-DOS, The structure of MS-DOS (BIOS Module, DOS kernel, command processor), Loading of MS-DOS. Introduction to *.com* and *.exe* programs, DOS & BIOS Interface, Interrupt Services, DOS & BIOS Interrupts.	10	

Unit: 4 Name of the Topics: **Advanced Microprocessors**	4.1 Salient features of 486 and its register structure. Internal Architecture 4.2 Salient features of Pentium System architecture (Super-scalar Execution, Separate code & data cache, Floating Point Exceptions, Branch prediction.)	5	
Unit: 5 Name of the Topics: **Microcontroller 8051**	5.1 Difference between Microprocessor and microcontroller. 5.2 Features of 8051 microcontroller 5.3 Internal architecture of 8051 5.4 RAM, ROM and SFRs details 5.5 Addressing modes and Instruction Set 5.6 Interrupt structure of 8051.	6	
Total		45	

Practical:

Skills to be developed:

Intellectual skills:

· Use of programming language constructs in program implementation

· To be able to apply different logics to solve given problem.

· To be able to write program using different implementations for the same problem

· Study different types of errors as syntax semantic, fatal, linker & logical

· Debugging of programs

· Understanding different steps to develop program such as

· Problem definition.

· Analysis.

· Design of logic

· Coding.

· Testing.

· Maintenance (Modifications, Error corrections, Making changes etc.)

Motor skills:

· Proper handling of Computer System**.**

List of Practical:

1) Write an assignment on keyboard and display function 01H.,02H,08H,09H,0AH of DOS INT 21H and program to read password & validate the user.

2) Write an assignment on keyboard functions 02H of BIOS INT 16H (Get Keyboard Flags) and program to display the status of keys described in 02H functions of BIOS INT 16H.

3) Write an assignment on screen functions 06H (Scroll screen up), 07H (Scroll screen down) of BIOS INT 10H and program to simulate CLS (Clear Screen) command.

4) Write an assignment on ASCIIZ string, file handle, file functions 41H (delete file), 56H (Rename file) of DOS INT 21H and program to simulate DEL (Delete file) and REN (Rename file) command.

5) Write an assignment on file functions 43H (Set/Get file attribute) and 57H (Set/Get file time & date) of DOS INT 21H and program to display the attribute and date/ time of any file.

6) Write an assignment on directory functions 39H (Create directory), 3AH (Delete directory) of DOS INT 21H and program to simulate MD (Make directory), RD (Remove Directory) commands.

7) Write an assignment on directory functions 3BH (Change Directory), 47H(Get current directory) of DOS INT 21Hand program to simulate CD (Change directory) and PWD (Present Working Directory) commands.

8) Write an assignment on Disk Storage Organization i.e. track, sector, cylinder, cluster, disk system area, data area and disk processing functions 02H(Read Sector), 03H (Write sector) of BIOS INT 13H.

9) Write a program to access mouse by using DOS INT 33H.

10) Write an assignment on Printer Control Characters i.e. Horizontal TAB, Line Feed, Form Feed, Carriage Return, Printer function 40H, 05H of DOS INT 21 H and 00H (Print character) of BIOS INT 17H and program to print ASCII character set on printer.

11) Write a program to display the status of Flag register and Machine Status Word register of 286 on the screen.

12) Write a program to display the status of Flag register and Machine Status Word register of 386 on the screen.

*** Any program like sorting, searching or program using DOS interrupt will be appreciated.

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
A. K. Ray & K. M. Bhurchandi	Advanced microprocessor & peripheral		TMH
BREY	The Intel Microprocessors		Pearson
Bahadure	Microprocessors: The 8086/8088, 80186/80286, 80386/80486 and the Pentium Family •		PHI
Mazidi	The 8051 Microcontrollers & Embedded Systems, 2e		Pearson
Peter Abel	IBM-PC assembly language		Pearson
SHAH	8051 Microcontrollers		Oxford
MacKenzie	The 8051 Microcontroller, 4e		Peearson

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Socha, Norton	Assembly language for the PC		PHI
Mazidi	**The X86 PC: Assembly Language, Design, and Interfacing, 5/e**		Pearson
Triebel	The 8088 and 8086 Microprocessors: Programming, Interfacing, Software, Hardware, and Applications, 4e		Pearson
Azeez, Shemeena	Microprocessors Interfacing and Microcontroller		Scitech
Subrata Ghoshal	Computer Architecture and Organization		Pearson

Note:

Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

Format for Syllabus

Name of the Course: Project (Phase-I & II)	
Course Code: CST/6/PI & II	**Semester: Fifth and Continued to sixth**
Duration: 4 hrs./week (Fifth Sem.)+ 6 Hrs/week (Sixth sem)	**Maximum Marks: 100 (to be given at end of Sixth semester)**
Teaching Scheme	**Examination Scheme**
Credit: 6	Practical: 50(INT)+50(EXT)
Aim:	

Sl. No.	
1.	To develop technical skill
2.	To make use of hardware in developing Software.
3.	Analysis of different type of case studies

Objective: Student will be able to

Sl. No.	
1.	Work in Groups, Plan the work, and Coordinate the work.
2.	Develop leadership qualities.
3.	Develop Innovative ideas.
4.	Practically implement the acquired knowledge.
5.	Develop basic technical Skills by hands on experience.
6.	Write project report.
7.	Develop skills to use latest technology in Computer/Information Technology field.
8.	Analyse the different types of Case studies

Pre-Requisite:

Sl. No.	
1.	How to prepare Project report
2.	Different software Domains
3.	Latest technology in market

Contents (Theory)		Hrs./Unit	Marks
Unit: 1 **How Project and Project report should be prepared?**	Initial idea should be given to the student about how to prepare for the Project and will be done through group work.	2	
Unit: 2 **Typical Software Projects**	(1) Develop Application Software for Hospital / Shopping Mall/Cinema/Theatre/Commercial Complex/Educational Institute/Industrial Complex. (2) Develop In-house Systems. (3) Case Studies Related to Industries – Operation / Maintenance / Repair and Fault Finding. (Refer Guideline Document). (4) Develop Information Processing System. (5) Develop Web Based Applications using Web Technologies. 6) Develop Network monitoring system. (7) Develop systems for financial organization. Develop System Program based system like compilers, editors, spreadsheets, mini database systems. (8) Develop Image Processing Systems. (9) Develop Expert Systems. (10) Develop Artificial Intelligence based Systems. (11) Develop mini operating system, assembler, Compiler or part of the system. **** Any other type of innovative projects will be appreciated.**	12	
Unit: 3 Hardware based Project	(1) Develop any Microprocessor or Microcontroller based project (2) Develop your own processor (3) Develop various types of interfacing Applications **** Any other type of innovative projects will be appreciated.**	8	

Note: You should concern about the latest technology from Magazines and take concept of your project from different Web sites.	
Sl. No.	
1.	Examination Scheme: **End Semester Examination: Examination will be held at the end of 6th semester. Internal marks should be given by the Project Guide. External marks should be given by the External examiner from any other Institutes or from Industries. **Each and every Lecturer of the corresponding Department must be associated with the project work.**

Format for Syllabus

Name of the Course:Professional Practice-III (Visual Basic)		
Course Code: CST/5/PP-III	Semester: FIFTH	
Duration:	Maximum Marks: 50 (Practical 50)	
Teaching Scheme	Examination Scheme	
Theory: hrs./week	Mid Semester Exam.: Marks	
Tutorial: hrs./week	Assignment & Quiz: Marks	
Practical: 3 hrs./week	End Semester Exam.: Marks	
Credit: 2		
Aim:		
Sl. No.		
1.	To learn basic concepts of VB programming.	
2.	To learn how to make database connectivity and database report.	
3.	To learn all the controls of VB 6.0 editor.	

Objective:	
Sl. No.	Students will able to:
1.	· Use GUI tools of Visual Basic Programming.
2.	· Use basic and advance VB controls.
3.	· Interface back-end and front-end.
4.	· Generate report using Data Report and Crystal Reports.
5.	· Build Visual Basic applications.

Pre-Requisite:	
Sl. No.	
1.	Computer handling

	Contents (Practical)
Sl. No.	Skills to be developed
1.	**Practical:** Skills to be developed: Intellectual skills: 1) Design various types of forms 2) Use image control and scroll bar 3) Selection of windows for different operations Motor skills: 1. Develop various types of forms **List of Practical:** 1. Study of VB environment with following details : - Form and their types. - Intrinsic components – text box, label, combo, list, heck box, and option button. - Design time properties. - Different windows and their uses. 2. Design forms to perform mathematical operations like addition, subtraction, multiplication and division using: - Text box, labels. Design forms to use Date, Time, String, Mathematics functions with help of text box, label, radiobutton, check box, combo box and command button. 4. Using image control and scroll bar, design form to change height, width of image, movement toimage. Using picture box and image list, flip the image on click of command button. 5. Design explorer using Directory, drive, file list box and commondialog controls. 6. Design text editor with menu having copy, cut, paste, select,search, replace the text and load and save the file. 7. Design stop watch with faculty of start, stop, reset using timercontrol, option, label, text box. 8. Practical including Data bound controls like DBgrid, DBcombo,Textbox, Combo, List, MS Flex grid and Database control like ADO, DAO, RDO to perform insertion,deletion, updation, display, Search. 9. Design MDI form including Menu bar, Toolbar, Status bar. 10. Design the interface to perform following operation on the file like create, open , read , write,delete , search.

	11. Design the Active X control for login form and transport it to browser 12. Design the Active X control to perform database operation with get and let property 13. Design the experiment using RTF box to create file, load, save search and edit the file. 14. Integrate all above practical to form mini project including login form and splash form.
2.	Motor Skills:· Proper handling of Computer System.

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Halvorson	Microsoft Visual Basic 2010 Step by Step (microsoft press)		pHI
Foxall	Sams Teach Yourself Visual Basic 2010 in 24 Hours Complete Starter Kit		PEARSON
	Visual Basic 2010 Programming (Black Book)		dreamtech
Newsome	Beginning Visual Basic 2012		Wiley India
Boehn	Murach's Visual Basic 2010		SPD
Krishnan	Visual basic in 30 days		Scitech
Varalakshmi	Visual basic Programming for Beginners		Scitech

Suggested list of Laboratory Experiments:

Sl. No.	Laboratory Experiments
1.	Simple calculator
2.	Design notepad.
3.	Scientific calculator.

Suggested list of Assignments / Tutorial:

Sl. No.	Topic on which tutorial is to be conducted
1.	List file handling commands in VB.
2.	Write note on active controls in VB.
3.	Write note on controls and events in VB.

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Format for Syllabus

Name of the Course: Computer Engineering Group **(Advanced Java Programming)**				
Course Code: CST/6/601		**Semester: SIXTH**		
Duration:		**Maximum Marks:100+100**		
Teaching Scheme		**Examination Scheme**		
Theory: 3 hrs./week		Mid Semester Exam.:	20	Marks
Tutorial: hrs./week		Assignment & Quiz:	10	Marks
Practical: 4 hrs./week		End Semester Exam.:	70	Marks
Credit: 3+2		**Practical 50 (int) + 50 (ext)**		

Aim:	
Sl. No.	
1.	To learn how to design web based application.
2.	To catch approach of Object Oriented Programming for building software.
3.	

Objective:	
Sl. No.	Students will able to:
1.	・ Create network based applications.
2.	・ Create business applications.
3.	・ Implement Server side programming.
4.	・ Develop dynamic software components.
5.	・ Develop database application.
6.	・ Design and develop powerful GUI based components.
7.	・ Create Animation using Applet, Thread and AWT controls.
8.	・ Make best use of facilities that computer systems offer them for solving problems.
9.	

Pre-Requisite:	
Sl. No.	
1.	Basic knowledge of programming.
2.	Knowledge of C & C++ and JAVA languages.
3.	Familiar with object oriented programming.

Contents (Theory)		Hrs./Unit	Marks
Unit: 1	**Introduction the Advanced Web Technology: (AWT)** 1.1 Working with Windows and AWT AWT classes Windows Fundamentals Working with frame windows Creating a frame window in applet Creating windowed program Display information within with in a window 1.2 Working with graphics Working with color Setting the paint mode	**10**	

	Working with Fonts Managing text output using Font Metrics Exploring text & graphics 1.3Using AWT Controls, Layout Managers and Menus Control Fundamentals Labels Using Buttons Applying Check Boxes Checkbox Group Choice Controls Using Lists Managing scroll Bars Using a Text Field Using a Text Area Understanding Layout Managers Menu Bars and Menu Dialog Boxes File Dialog Handling events by Extending AWT Components Exploring the Controls, Menus, and Layout Managers		
Unit: 2	**Networking:** 2.1 Basics Socket overview, client/server, reserved sockets, proxy servers,internet addressing. *2.2* Java & the Net The networking classes & interfaces 2.3 Inet address Factory methods, instance method 2.4 TCP/IP Client Sockets What is URL Format 2.5 URL connection 2.6 TCI/IP Server Sockets 2.7 Data grams Data gram packets, Data gram server & client	**10**	
Unit: 3	**The Tour of Swing** 4.1 J applet, Icons and Labels ,Text Fields, Buttons Combo Boxes Tabbed Panes, Scroll Panes. 4.2 Trees, Tables, Exploring the Swings.	**08**	
Unit: 4	**Servlets** 5.1 Background, The Life Cycle Of a Servlet,The Java Servlet Development Kit, The Simple Servlet, The Servlet API 5.2 The Javax Servlet Package, Reading Servlet Parameters Reading Initialization Parameters The Javax. Servlet. http package, Handling HTTP Requests and responses 5.3 Using Cookies, Session Tracking, Security Issues	07	

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	Exploring Servlet.System model, principle necessary		
Unit: 5	**JavaBeans Component :** Bean Writing Process, Using Beans to build an Application, Beans Property Type	05	
Unit: 6	**Security**- Class Loader, Byte code Verification, Security Managers and Permissions, User Authentication, Digital Signatures, Code Signing, Encryption.	05	
Total		**45**	

Contents (Practical)	
Sl. No.	Skills to be developed
1.	Intellectual Skills:

· Use of programming language constructs in program implementation.

· To be able to apply different logics to solve given problem.

· To be able to write program using different implementations for the same problem

· Study different types of errors as syntax semantic, fatal, linker & logical

· Debugging of programs

· Understanding different steps to develop program such as

· Problem definition

· Analysis

· Design of logic

· Coding

· Testing

· Maintenance (Modifications, error corrections, making changes etc.) |
| 2. | Motor Skills:· Proper handling of Computer System. |

List of Practical:

Sr. No.	Practical
1	Write a program to design a form using components textbox, text field, checkbox, buttons, list and handle various events related to each component.
2	Write a program to design a calculator using Java components and handle various events related to each component and apply proper layout to it.
3	Write a program to demonstrate use of Grid Layout.
4	Write a program to demonstrate use of Flow Layout.
5	Write a program to demonstrate use of Card Layout.
6	Write a program to demonstrate use of Border Layout.
7	Write a program to display any string using available Font and with every mouse click change the size and / style of the string. Make use of Font and Font metrics class and their methods.

8	Write a program to create a menu bar with various menu items and sub menu items. Also create a checkable menu item. On clicking a menu Item display a suitable Dialog box.
9	Write a program to increase the font size of a font displayed when the value of thumb in scrollbar increases at the same time it decreases the size of the font when the value of font decreases.
10	Write a program to retrieve hostname using methods in Inet Address class.
11	Write a program that demonstrates TCP/IP based communication between client and server.
12	Write a program that demonstrates UDP based communication between client and server.
13	Write a program to demonstrate use of URL and URL Connection class for communication.
14	Write a program to design a form using basic swing components.
15	Write a program to demonstrate the use of scroll panes in Swing.
16	Write Java Program to map Directory tree.
17	Write a Java program to demonstrate the use of Tables.
18	Write a servlet for demonstrating the generic servlet class.
19	Write a servlet for demonstrating the generic servlet class.
20	Write a servlet to demonstrate the Http Servlet class using do Get ().
21	Write a servlet to demonstrate the Http Servlet class using do Post ().
22	Write a servlet to demonstrate the cookie.

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Horstmann, Cornell	Core Java Vol II		PEARSON
Savaliya	Advance Java Technology		Dreamtech
Debasish Jana	Java and Object Oriented Programming Paradigm		PHI
Geary / Horstmann	Core Java Server Faces, 3e		Pearson
De Jonge	Essential App Engine: Building High-Performance Java Apps with Google App Engine		Pearson
Hall	Core Servlets and Java Server Pages Volume II: Advanced Technologies 2e		Pearson
Hall	Core Servlets and JavaServer Pages: Volume I: Core Technologies, 2e		
Murach	Murach's Java Servlets and JSP		SPD
kogent	Java Server Programming Java EE6		Dreamtech
C. Darby, J. Griffin and others	Beginning Java Networking	2nd	Wrox
Mahesh P. Matha	JSP and Servlets		PHI

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Herbert Schildt	JAVA 2: The Complete Reference		Tata Mc-Graw Hill Pub. Co. Ltd
Harold	Java Network Programming		SPD

Suggested list of Laboratory Experiments:

Sl. No.	Laboratory Experiments
1.	Design employee information form and perform the validations.

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2.	Program for user login using JSP.
3.	Program for client server communication.
4.	

Suggested list of Assignments / Tutorial:	
Sl. No.	Topic on which tutorial is to be conducted
1.	Assignment on AWT, event controls, layout manager, menus.
2.	Assignment on different JDBC connections in Java.
3.	Assignment of servlet life cycle.

Note:	
Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

Format for Syllabus

Name of the Course:Computer Engineering Group **(System Programming & Compiler Design)**	
Course Code: CST/6/602	**Semester:** SIXTH
Duration:	**Maximum Marks:100+50**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Assignment & Quiz: 10 Marks

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Practical:	2 hrs./week	End Semester Exam.:	70	Marks
Credit: 3+1		**Practical 25(int) + 25(ext)**		

Aim:			
Sl. No.			
1.	To study techniques for development of system related applications and services.		
2.	It is the activity of programming system software.		
3.	It aims to produce software which provides services to the user.		
Objective:			
Sl. No.	After studying the subject students will be able to		
1.	Understand various design aspect of the system software.		
2.	Develop software tools like editors and debuggers.		
3.	Develop various system software.		

Pre-Requisite:			
Sl. No.			
1.	Knowledge of programming languages.		
2.	Knowledge of system tools available in computer system.		
3.	Knowledge of assembly language program.		

Contents (Theory)		Hrs./Unit	Marks
Unit: 1	**Features of System Programming** 1.1 What is System Software 1.2 Components of System Software : Assemblers; Loaders; Macros;Compilers 1.3 Evolution of System Software 1.4 Foundations of system Programming.	**04**	
Unit: 2	**Assemblers** 2.1 General design procedure 2.2 Design of the assembler - Statement of the problem; DataStructure; Format of databases; Algorithm; Look for modularity. 2.3 Table Processing: Searching and Sorting- Linear Search; Binary Search	**06**	
Unit: 3	**Macro Language and Macro Processors** 3.1 Macro Instructions 3.2 Features of a Macro facility - Macro Instruction Arguments;Conditional macro expansion; Macro call within Macros; MacroInstruction defining Macros. 3.3 Implementation - Implementation of restricted faculty : Two PassAlgorithm, A Single Pass Algorithm, Implementation of macro callswithin Macros, Implementation within an assembler	**08**	
Unit: 4	**Loaders** 4.1 Loaders Schemes - "Compile and go" loaders; General LoaderSchemes; Absolute Loaders; Subroutine linkages; Relocatingloaders; Direct linking loaders; Other loaders scheme: Binders,Linking loaders Overlays, Dynamic Binders. 4.2 Design of Absolute loaders	04	

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	4.4 Design of Direct Linking Loaders: Specification Problem;Specification of data structures; Format of database; Algorithm.	
Unit: 5	**Compliers** 5.1 Statement of a problem - Recognizing basic elements; Recognizing Syntactic units and Interpreting meaning;Intermediate from: Arithmetic statements, Non-Arithmetic statement, Non-executable statements; Storage Allocation; Code Generation: Optimization(M/c independent), Optimization(M/c dependent); Assembly Phase; General Model of Compiler. 5.2 Phases of Compiler	03
Unit: 6	**Lexical Analysis** 6.1The role of the lexical analyzer, Tokens, Patterns, Lexemes, Input buffering, Specifications of a token, Recognition of a tokens. .	05
Unit: 7	**Syntax Analysis** 7.1 The role of a parser, Context free grammars, 7.2 Writing a grammar, Top down Parsing, 7.3 Non-recursive Predictive parsing (LL), 7.4 Bottom up parsing, Handles, 7.5 Viable prefixes, 7.6 Operator precedence parsing.	**05**
Unit: 8	**Syntax directed translation** 8.1Syntax director definitions, Construction of syntax trees.	**02**
Unit: 9	**Intermediate code generation** 9.1 Intermediate languages, 9.2 Graphical representation, 9.3 Three-address code, 9.4 Implementation of three address statements (Quadruples, Triples, Indirect triples). **Code optimization** 9.5 Introduction, 9.6 Basic blocks & flow graphs, 9.7 Transformation of basic blocks, 9.8 Dag representation of basic blocks, 9.9 The principle sources of optimization, 9.10 Loops in flow graph, Peephole optimization.	**08**
Total		**45**
Contents (Practical)		
Sl. No.	Skills to be developed	
1.	**Practical:** Skills to be developed:	

	1. Programming skills
	2. Design of assemblers
	3. Logical Thinking
2.	Motor Skills: • Proper handling of Computer System.

List of Practical:

Sr. No.	Practical
1	Programming on sorting and searching techniques Liner search, Binary search, Interchange sort; Shell sort; Bucket sort; Radix exchange sort; Address calculation sort; Comparisons of sort; Hash or Random entry searching.
2	Design of a single pass assembler or two pass assembler.
3	Design of Macro Processor.
4	Design of Loaders.
5	Design of various phases of Compiler.

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Aho, Sethi, Ullman	Compilers principles, techniques, and tools		PEARSON
Beck	Systems Software, 3e	2nd	PEARSON
PAL	System Programming		OXFORD
John J. Donovan	System Programming		TMH
Grune	Modern Compiler Design		WILEY
DHAMDHERE	Systems Programming		Tata McGraw-Hill Edition
Muneeswaran	Compiler Design		Oxford
Chattopadhyay	Compiler Design		pHI
Shalini	System Software		Scitech
chattopadhyay	System software		pHI
Sadasivam	Compiler Design		Scitech

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
John J. Donovan	System Programming		Tata McGraw-Hill Edition2003

Suggested list of Laboratory Experiments:

Sl. No.	Laboratory Experiments
1.	Take a simple piece of code and separate the tokens from it.
2.	Program for simple macro processing.
3.	Program for pass-I assembler.

Suggested list of Assignments / Tutorial:

Sl. No.	
1.	Different phases in compilations.
2.	Macro processing in details.
3.	Assignment of compiler, assemblers, macro, linkers and loaders.

Note:

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Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

Format for Syllabus

Name of the Course: ELECTIVE II (Numerical Methods)	
Course Code: CST/6/603(I)	Semester: Sixth
Duration:	Maximum Marks: 100+50
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Attendance, Assignment & Quiz: 10 Marks
Practical: 4 Hrs./week	End Semester Exam.: 70 Marks
Credit: 3 +2	Practical: 25(INT)+25(EXT)
Aim:	
Sl. No.	

1.	This subject enhances the knowledge of students about numerical side of mathematical analysis. It also intends to teach methods and means for estimating the accuracy of numerical results.

Objective: Student will be able to

Sl. No.	
1.	Understand Error Handling
2.	Understand Numerical methods of Polynomial Interpolation
3.	Understand Numerical methods of Algebraic and Transcendental Equation.
4.	Understand Numerical Differentiation & Integration

Pre-Requisite:

Sl. No.	
1.	Basic knowledge of Mathematics is helpful.
2.	Basic knowledge of C programming is helpful.
3.	

Contents (Theory)		Hrs./Unit	Marks
Unit: 1 Name of the Topics: **Error Handling**	1.1 Approximation in Numerical Computation 1.2 Significant Figures 1.3 Absolute, Relative and Percentage Errors 1.4 Truncation and Round-off Errors 1.5 Accumulation and Propagation of Errors	4	
Unit: 2 Name of the Topics: **Polynomial Interpolation**	2.1 Forward, Backward and Divided Difference Table 2.2 Newton's Forward and Backward Interpolation Formula 2.3 Newton's General Interpolation Formula with the remainder term 2.4 Lagrange's Interpolation Formula 2.5 Inverse Interpolation	12	
Unit: 3 Name of the Topics: **Solution of Algebraic and transcendental Equation.**	3.1 Method of Tabulation 3.2 Bisection Method 3.3 Newton-Raphson Method.	8	
Unit: 4 Name of the Topics: **Numerical Differentiation & Integration**	4.1Differentiation of Forward and Backward Formula 4.2 Trapezoidal rule 4.3 Simpson's 1/3 rule	8	
Unit: 5 Name of the Topics: **Numerical Solution of a System of Linear Equation**	5.1 Gauss-Elimination Method 5.2 Matrix Inversion Method 5.3 Gauss-Jacobi Method 5.4 Gauss-Siedal Method	9	
Unit: 6 Name of the Topics: **Solution of Ordinary Differential Equation**	6.1 Solution of first order Differential Equation by Euler's Method 6.2 Modified Euler's Method and Runge-Kutta Method	4	
Total		**45**	

Practical:

Practical Content:
All of the experiment shall be performed using C or MATLAB
List of Experiments:
1 Implementation of Forward, Backward and Divided Difference Table
2 Implementation of Newton's Forward and Backward Interpolation Formula

3 Implementation of Newton's General Interpolation Formula with the remainder term

4 Implementation of Lagrange's Interpolation Formula

5 Implementation of Inverse Interpolation

6 Implementation of Bisection Method

7 Implementation of Newton-Raphson Method

8 Implementation of Differentiation of Forward and Backward Formula

9 Implementation of Trapezoidal rule

10 Implementation of Simpson's 1/3 rule

11 Implementation of Gauss-Elimination Method

12 Implementation of Matrix Inversion Method

13 Implementation of Gauss-Jacobi Method

14 Implementation of Gauss-Siedal Method

15 Implementation of Euler's method

16 Implementation of Runge-Kutta Method

*** Any type of Image processing task can be done. Some task may be performed without using the library function of MATLAB(I,e. by programming).

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Babu Ram	Numerical Methods		Pearson
Thandaraj	Computer-Oriented Numerical Methods with c language		PHI
Sujata Sinha	Numerical and Statistical Methods with Programming in C		Scitech
Bradie	A Friendly Introduction to Numerical Analysis		Pearson
J. B. Scarborough	Numerical Mathematics Analysis		Oxford
Dasgupta	Applied Mathematical Methods		Pearson
Sastry	Introductory Methods of Numerical Analysis, 5th ed. •		PHI
DEY	Numerical Methods		TMH
Jain, Iyengar& Jain	Numerical Methods (Problems & Solutions)		
Datta	Computer Oriented Numerical Methods		Vikas
Mollah, Chakrabarty	Computing Systems		JBBL
Gerald	Applied Numerical Analysis, 7e		Pearson
C. Froberg	Introduction to Numerical Analysis		Addison Wesley

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Balagurusamy	Numerical Methods		TMH
Fausett	Applied Numerical Analysis Using MATLAB, 2e		Pearson
AruMugam	Numerical Methods		Scitech

Note:

Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5**

	questions each carrying 10 marks

Format for Syllabus

Name of the Course: Computer Engineering Group **(**Advanced Web Technology **(ELECTIVE - II))**	
Course Code: CST/6/603(II)	**Semester:** SIXTH
Duration:	**Maximum Marks: 100 + 50**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Class Test: 20 Marks
Tutorial: hrs./week	Teachers Assessment: 10 Marks
Practical: 4 hrs./week	End Semester Exam.: 70Marks
Credit: 3+2	**Practical 25(int) + 25(ext)**
Aim:	
Sl. No.	
1.	To Study the techniques to develop web communication services.
2.	It provides information about web technologies that relate to the interface between web servers and their clients
3.	Web technologies are used to support the world wide web and more are being developed all the time.
Objective:	
Sl. No.	Students will able to:
1.	・ Use GUI tools of. Net framework

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2.	· Use basic and advance. Net controls.
3.	· Interface back-end and front-end.
4.	· Build applications integrated with .Net Framework.
5.	· Build net based applications.
6.	· Transfer code form VB to VB.net.
7.	· Can do Asp Transaction.

Pre-Requisite:	
Sl. No.	
1.	Basic knowledge of web technology- web1.0, web2.0, semantic web.
2.	Knowledge of client-server system, java-script, php, etc.
3.	Knowledge of HTML, CSS, XML, ASP, JSP, etc.

Contents (Theory)		Hrs./Unit	Marks
Unit:1	**Introduction** 1.1 Why dot Net - Introduction to Microsoft .Net Framework. - Building blocks in .Net - Drawback of previous languages. - Understand what is .Net 1.2 VB.Net - VB.Net overview. - Difference between VB and VB.Net 1.3 Introduction to .Net - Types of application architecture. - .Net initiative. - .Net framework: components of .Net framework, Advantages, requirement of .Net.	**08**	
Unit: 2	**Introduction and implementation** 2.1 Introduction to VB.Net - Features. - VB.Net IDE. - Data Types, Loops, Control structures, Cases, Operators. - Creating forms. - Procedures and functions. - Form controls. 2.2 Implementation of OOP - Creation of class and objects. - Inheritance. - Constructors. - Exception handling. 2.3 Component based programming - Working with Private assembly, shared assembly. - Using COM components developed in VB or other language.	**06**	
Unit: 3	**Introduction to ADO.Net and data manipulation**	**06**	

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	3.1 Introduction to ADO.Net - What is database? - Writing XML file. - ADO.Net architecture. - Creating connection. - Dataset and Data reader. - Types of Data adapter and ADO controls. - Reading data into dataset and data adapter. - Binding data to controls. - Data table and Data row. 3.2 Accessing and manipulating data - Selecting data. - Insertion, deletion, updating, sorting. - How to fill dataset with multiple tables. 3.3 Multi-threading - Working with multithreading. - Synchronization of Threads. 3.4 Migrating from VB 6.0 to VB.Net - Updating the applications developed in VB to VB.net		
Unit: 4	**Introduction to ASP.Net** - Difference between ASP and ASP.Net - Introduction to IIS. - What is web application? Why it is used? - ASP.Net IDE. - Creation of web forms. - Using web form controls.	**04**	
Unit: 5	**ASP.Net objects and components** - Response. - Server. - Application. - Session. - ASP.Net scope, state, view state, post back and configuration. - Object creation: Scripting, Drive, folder, file. - How to use objects? - Server components : Ad rotator, Content linker, Browser capabilities. - Use and creation of global .asa file. - How to use Application object. - Events - Methods and collection. - Example. - How to use session object : enabling and disabling of session, Event, properties, methods, collection. - Example.	08	
Unit: 6	**ADO.Net** 6.1 ADO.Net in ASP.Net - Connection.	08	

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	- Dataset and data reader. - Data table and Data row. - Web.config introduction. - Binding data with data grid. - Accessing and manipulating data. 6.2 ADO.Net : Server control templates and Data binding techniques - Understand data access in .Net using ADO.Net - Understand various Server Control Templates available for Data Binding like Repeater. - Data List and Data Grid Controls.		
Unit: 7	**ASP transactions and e-mail** - Transactions. - Transaction db design. - CDONTS object. - Email sending web page creation.	05	
	Total	45	
	Contents (Practical)		
Sl. No.	Skills to be developed		
1.	**Practical:** Skills to be developed: Intellectual skills: Use of programming language constructs in program implementation. ・ To be able to apply different logics to solve given problem. ・ To be able to write program using different implementations for the same problem ・ Study different types of errors as syntax semantic, fatal, linker & logical ・ Debugging of programs ・ Understanding different steps to develop program such as ・ Problem definition ・ Analysis ・ Design of logic ・ Coding ・ Testing ・ Maintenance (Modifications, error corrections, making changes etc.)		
2.	Motor Skills:・ Proper handling of Computer System**.**		

List of Practicals:

1. Introduction to .Net framework.

2. a) Design Login form with validation.

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b) Design Registration form with validation of email address, date of birth,

blank field, telephones and mobile numbers etc.

3. Design form, make it a class, create its object and access it from another form.

4. Design student class, marks class, inherits it in result class and access it using form.

5. Create instance of class using new operator of above example.

6. Design mark sheet of student using XML file and dataset.

7. Design employee details with help of database (back-end) using data adapter,

data reader and datasets. Use data grid to display result.

8. Generation of database (data table) of employee or student with help of data tables of .Net.

9. To use multiple table design example of employee and department.

10. Design registration form of college using text box, text area, radio list, check list,

button etc. using Autopostback property.

11. Simple application for following function: (1) Login (2) Surfing (3) Logout taking

into considerations (Application, Session, Server object, global .asa file and their

events, methods and collection) also demonstrates enabling and disabling of session.)

12. Creation of file, entry, reading data from a file.

13. Using components create:

(1) Advertisement (using Ad rotator)

(2) Book example (using Next function)

(3) Find capabilities of browser (Browser object capabilities)

14. Online application (student, employee, product, shopping mall)

(a) Using dataset, data reader.

(b) Same application using data table and data row. (use data grid to display data)

(c) Bind the data to data grid using properties / templates.

(d) Display details (student, employee, product, etc.) using data list. (4 cols per line)

15. Application which sends email.

Mini Project :

 Design the mini project by integrating all the experiment performed as mentioned in the curriculum

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Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Esposito	Programming Microsoft ASP.Net		WILEY
Chavan	Visual BasiC. NET	2nd	PEARSON
Spaanjaars	ASP.NET 4.5 in C# and VB		Wiley India
Anita &Bradely	Prog. In VB.Net		TATA Mc Grow Hill
Esposito	Professional ASP.Net 4 in C# and VB		WILEY
Newsome	**Beginning Visual Basic 2012**		Wiley India
Boehm	**Murach's ASP.NET 4 Web Programming with VB 2010**		SPD
RadhaGanesan	**VB.Net**		Scitech

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Ivan Bayross	Teach Yourself Web		BPB Publications

		Technologies - Part I		
Deitel		XML: How to Program		Pearson

Suggested list of Laboratory Experiments:	
Sl. No.	Laboratory Experiments
1.	Design the customer information form and perform the different validations.
2.	Write a program to access values from the previous form.
3.	Write a code in asp.net to perform the login validation.
Suggested list of Assignments / Tutorial:	
Sl. No.	Topic on which tutorial is to be conducted
1.	The details of asp.net, vb.net and ADO.net.
2.	Assignment on ASP.net objects and components.
3.	Assignment on web technologies in vb.net.
Note:	
Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

Format for Syllabus

Name of the Course: ELECTIVE II (Digital Image Processing)	
Course Code: CST/6/603(III)	**Semester: Sixth**
Duration:	**Maximum Marks: 100 +50**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	Mid Semester Exam.: 20 Marks
Tutorial: hrs./week	Attendance, Assignment & Quiz: 10 Marks
Practical: 4 Hrs./week	End Semester Exam.: 70 Marks
Credit: 3 +2	Practical: 25(INT)+25(EXT)
Aim:	
Sl. No.	
1.	Student should able to do various image processing task
Objective: Student will be able to	
Sl. No.	
1.	Understanding of digital image fundamentals.
2.	Understanding of image digitization.
3.	Understanding of image display hardware and software.
4.	Ability to understand and apply image enhancement and restoration techniques.
5.	Understanding of image encoding techniques.
6.	Ability to apply compression techniques.

Pre-Requisite:	
Sl. No.	
1.	Basic knowledge of Digital Image is helpful.

2.	Basic knowledge of Color and graphics is helpful.		
3.			
Contents (Theory)		Hrs./Unit	Marks
Unit: 1 Name of the Topics: **Basics of Image Processing**	1.1 Overview & Nature of Image Processing 1.2 Digital Image Representation & types of Images 1.3 Steps in Image Processing. 1.4 Image Processing Applications 1.5 Components of Image Processing system.	4	
Unit: 2 Name of the Topics: **Digital Image Fundamentals**	2.1 Elements of Visual Perception 2.2 Image Sensing and Acquisition 2.3 Image Sampling and Quantization. 2.4 Basic Relationships Between Pixels 2.5 Linear and non-linear operations.	3	
Unit: 3 Name of the Topics: **Image Enhancement in the Spatial Domain**	3.1 Some Basic Gray Level Transformations, 3.2 Histogram Processing in details, 3.3 Enhancement UsingArithmetic/Logic Operations, 3.4 Basics of Spatial Filtering, 3.5 Smoothing Spatial Filters, 3.6 Sharpening Spatial Filters, 3.7 Combining Spatial Enhancement Methods	10	
Unit: 4 Name of the Topics: **Image Restoration.**	4.1 A Model of the Image degradation/Restoration process, 4.2 Noise Modelling, 4.3 Image Restoration in thePresence of Noise Only– Spatial Filtering, • Arithmetic mean filter • Geometric mean filter • Median filter 4.4 Image Restoration Techniques • Inverse filter • Wiener Filter 4.5 Geometric Transformations	10	
Unit: 5 Name of the Topics: **Color Image Processing**	5.1 Color image storage & processing 5.2 Color Models • RGB, HSI, HSV,CMY, CMYK color models. 5.3 Pseudocolor Image Processing 5.4 Basics of Full-Color Image Processing 5.5 Color Transformations 5.6 Smoothing and Sharpening	8	
Unit: 6 Name of the Topics: **Image Compression**	6.1 Fundamentals of image compression 6.2 Image Compression Models 6.3 Compression Algorithms 6.4 Error-Free/lossless Compression • Run Length Coding • Huffman Coding • Shannon –Fano Coding • Bit-plane Coding 6.5 Lossy Compression	10	

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	• Lossy Predictive Coding • Transform Coding 6.6 Image Compression Standards		
Total		**45**	

Practical:

Practical Content:
All of the experiment shall be performed using MATLAB
List of Experiments:
1. Image resizing, Image type conversion.
2. Extraction of color band, Creation of a synthetic image.
3. Image addition and Image complement.
4. Image geometric operations
5. Histogram operations, contrast stretching and gamma correction.
6. Image noise models
7. Spatial filtering
8. Implement the Wiener filter
9. Image segmentation
10. Color image operation – color model transformation, contrast stretching, histogram manipulation etc.

*** Any type of Image processing task can be done. Some task may be performed without using the library function of MATLAB(I,e. by programming).

Text Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Gonzalez	Digital Image Processing		Pearson
Sridhar	Digital Image Processing		Oxford
Jayraman	Digital Image Processing		TMH
Joshi	Digital Image Processing—An Algorithmic Approach •		PHI
Chanda&Majumdar	Digital Image Processing and Analysis, 2nd ed. •		PHI
Castleman	Digital Image Processing		Pearson
Annadurai	Fundamentals of Digital Image Processing		Pearson
Sudhir, Patil	Digital Image Processing		Vikas
Dey and Ray	MatLab Programming for Engg and Science		SPD

Reference Books:

Name of Authors	Title of the Book	Edition	Name of the Publisher
Gopi	Digital Image Processing using Matlab		Scitech
Gonzalez	Digital Image Processing using Matlab		TMH

Note:

Sl. No.	
1.	Question Paper setting tips: **End Semester Examination: Question should be made as per class weight and must cover whole syllabus. Objective Type: 20 marks (answered in one or two sentences. Subjective type: 50 marks. To be set at least 8 question and to be answered 5 questions each carrying 10 marks**

Format for Syllabus

Name of the Course:Professional Practice-IV(Seminar Work)	
Course Code: CST/6/PP-IV	Semester: Sixth
Duration: 3 hrs/week For preparing their presentation.	Maximum Marks: 50 (Internal marks to be given at end of Sixth semester)
Credit: 3	
Examination Scheme:	
1.	Seminar on Project Work **is intended to provide opportunity for students to present the Project Work/Modern development in Computer Science, in front of a technical gathering (Student / Teacher and others) with the help of different oral, audio and visual communication aids which they learnt through different courses in the diploma course. In the Seminar, students are not only expected to present their Project Work, but also to defend the same while answering questions arising out of their presentation.**

Format for Syllabus

Name of the Course: General Viva - Voce	
Course Code: CST/6/GVV	Semester: Sixth
Duration:	Maximum Marks: 100 (to be given at end of Sixth semester) 50(int) + 50(ext)
Credit: 3	
Examination Scheme:	
1.	**The Final Viva-Voce Examination shall take place at the end of the Part – III Second Semester. It is to be taken by one External and one Internal Examiner. The External Examiner is to be from industry / engineering college / university / government organisation and he / she should give credit out of 50 marks; whereas, the Internal Examiner should normally be the Head of the Department and he / she should give credit of 50 marks. In the absence of the Head of the**

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	Department, any other lecturer will act as the Internal Examiner.
3.	
4.	
5.	