Diploma in Computer Engineering
Revision 2015
Syllabus

Diploma in Computer Engineering
Revision 2015
Syllabus
Semester - I

Semester I

S. No	Code	Course	Course Category	Periods per week			Credits	Type	Evaluation	
				Theory	Practical	Total			CA	External
1	1001	English for Communication I	F	2	2	4	3	T	50	100
2	1002	Engineering Mathematics I	F	6	0	6	6	T	50	100
3	1003	Engineering Physics I	F	3	0	3	3	T	50	100
4	1004	Engineering Chemistry I	F	3	0	3	3	T	50	100
5	2005	Engineering Graphics	F	2	3	5	0	D	0	0
6	1009	Health & Physical Education	C	1	2	3	2	P	50	50
7	2008	Workshop Practice	F	0	3	3	0	P	0	0
8	1008	Computing Fundamentals	C	2	3	5	4	P	50	50
9	2007	Engineering Science Lab I	F	0	3	3	0	P	0	0
				19	16	35	21			

COURSE TITLE : ENGLISH FOR COMMUNICATION I
COURSE CODE : 1001
COURSE CATEGORY : F
PERIODS/WEEK : 4
PERIODS/SEMESTER : 60
CREDITS : 3

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Nurturing Nature – Environmental issues	15
2	Towards Tomorrow – Science & Technology	15
3	Sport 'S' miles – Sports & adventure	15
4	Media Matters - Media	15
TOTAL		**60**

COURSE OUTCOME:

To develop the four basic skills in English and use them effectively in day-to-day life.

SPECIFIC OUTCOME:

After completing the course the student will be able to:

- Read articles, essays, and technical writings of various kinds and develop comprehension about the message, images, thoughts and ideas contained in these articles.
- Read short stories, poems, conversations and develop aesthetic sense and humanitarian ethos.
- Read various prose passages and develop skills in skimming and scanning.
- Understand the meaning of words used in passages by guessing meaning from the context.
- Develop curiosity about the different topics of current interest and express points of view.
- Familiarise themselves with different techniques of writing and use them effectively in business correspondences.
- Group and sequence ideas and exploit the potentials of cohesion and coherence.
- Acquire proficiency in correct usage of English words.
- Internalise correct pronunciation and use them in daily conversation.
- Develop communication skills by taking part in group discussions and present their views in a logical and convincing way.
- Learn different language functions like agreeing, permitting, apologizing, negating and the like and use them effectively in daily communication.
- Identify the different study skills and use them to improve their academic performance.

CONTENT DETAILS

MODULE - I

1.1 Reading Passage - Environmental Issues.
1.2 Vocabulary – Guessing meaning from the given clues and context
1.3 Grammar – Nouns, Pronouns, Adjectives, Articles & Determiners
1.4 Writing – Basic tips of writing
1.5 Language functions – Making requests, Agreeing/disagreeing
1.6 Speaking – Introducing oneself

MODULE - II

2.1 Reading Passage - Advancement in Science & Technology.
2.2 Vocabulary – Antonyms & Synonyms
2.3 Grammar – Verb Patterns, Concord,
2.4 Language functions – Asking/giving permission, Giving instructions
2.5 Writing – Introducing cohesive devices, writing a paragraph
2.6 Speaking – Presentation using PPT

MODULE - III

3.1 Reading passage - Sports and Adventure.
3.2 Vocabulary – Spelling, collocation
3.3 Grammar – Telling about what is happening, happened and will happen
3.4 Language functions – Accepting/negating, Apologizing
3.5 Writing – Job Application/Resume
3.6 Speaking – Telephone Conversation

MODULE - IV

4.1 Reading passage based on media.
4.2 Vocabulary – Technical Vocabulary – Related to computer, industry, business and Administration.
4.3 Grammar – Establishing cause & effect, telling about positions.
4.4 Language functions – Congratulating others, Expressing one's opinion, Giving directions.
4.5 Writing –An introduction to Technical Writing and Memos.
4.6 Speaking – Group Discussion.

REFERENCE BOOKS:-

1. Course Book – Words to Deeds (A Coursebook in English for Polytechnic College Students – Semester I)

COURSE TITLE : ENGINEERING MATHEMATICS – I
COURSE CODE : 1002
COURSE CATEGORY : F
PERIODS/WEEK : 6
PERIODS/SEMESTER : 90
CREDITS : 6

TIME SCHEDULE

MODULE NO.	CHAPTER NO	CHAPTER TITLE	PERIODS.
I	**TRIGONOMETRY-I**		
	1	ANGLES	**2**
	2	TRIGONOMETRIC RATIOS	**5**
	3	TRIGONOMETRIC RATIOS OF RELATED ANGLES	**5**
	4	HEIGHTS AND DISTANCES	**4**
	5	COMPOUND ANGLES	**6**
II	**TRIGONOMETRY-II**		
	6	MULTIPLE AND SUB MULTIPLE ANGLES	**4**
	7	SUM OR DIFFERENCE FORMULAE AND CONVERSE	**4**
	8	PROPERTIES AND SOLUTIONS OF TRIANGLES	**10**
III	**DIFFERENTIAL CALCULUS**		
	9	FUNCTIONS AND LIMITS	**4**
	10	DIFFERENTIATION-I	**10**
	11	DIFFERENTIATION-II	**10**
IV	**APPLICATIONS OF DIFFERENTIATION**		
	12	EQUATIONS OF TANGENTS AND NORMALS	**4**
	13	RATES AND MOTION	**8**
	14	MAXIMA AND MINIMA	**4**
	15	TUTORIALS, TESTS, ASSIGNMENTS	**10**
TOTAL PERIODS			**90**

COURSE OUTCOME:

Students will be able to:-

- Describe the concept of an angle, its units and measurement.
- Define trigonometric ratios
  comprehend trigonometric ratios of standard angles
- Understand related angles of the type (n 90±θ) and solve simple problems on related angles
- Estimate heights and distances using trigonometry
- Define compound angles, multiple and sub multiple angles and state compound angles, multiple and sub multiple angles, sum or difference & converse formulae apply these formulae in solving problems
- State sine rule, cosine rule, tangent rule & projection formula and apply these rules to solve a given triangle
- Distinguish variables, constants and functions
- Evaluate the limit of a given function
- Define derivative of a function
- State standard results and rules of differentiation
- Apply the results and rules to solve problems
- Perform different methods of differentiation
- Solve problems on successive differentiation up to second order
- Illustrate derivative as a rate measurer
- Formulate and compute velocity and acceleration of a moving body
- Identify derivative as the slope of the tangent
- Estimate rate of change in related rate problems
- Evaluate maximum and minimum values of a function
- Solve simple problems on maxima and minima

SPECIFIC OUTCOME

MODULE-I TRIGONOMETRY-I

1.1 ANGLE

1.1.1 Definition of an angle.
1.1.2 Concept of an angle in trigonometry ,
1.1.3 Different systems of measuring an angle.
1.1.4 Definition of degree and radian.
1.1.5 Express a right angle in different systems,
1.1.6 Relation between degree & radian .

1.2 TRIGONOMETRIC RATIOS.

1.2.1 Definition of Trigonometric ratios

1.2.2 Trigonometric identities.(statements only)

1.2.3 Problems based on trigonometric identities,

1.2.4 Trigonometric ratios of standard angles like 0^0, 30^0, 45^0, 60^0 and 90^0.

1.2.5 Problems.

1.3 TRIGONOMETRIC RATIOS OF RELATED ANGLES

1.3.1 Angle of any magnitude and sign

1.3.2 Give examples to differentiate positive and negative angles

1.3.3 Trigonometric ratios in different quadrants and signs ASTC-Rule

1.3.4 Finding all other t-functions, when a t-function in a particular quadrant is given.

1.3.5Complementary angles and relation between trigonometric ratios of complementary angles.

1.3.6 Formulae of 90± □, 180± □, 270± □, 360± □ and (-□)

1.3.7 Evaluation of sin 120, cos 330, tan 315

1.3.8 Problems on related angles.

1.4 HEIGHTS AND DISTANCES

1.4.1 Angle of elevation and angle of depression.

1.4.2 Simple problems on height and distance.

1.5 COMPOUND ANGLES.

1.5.1 Compound angles

1.5.2 Examples for compound angles.

1.5.3 Formulae of sin(A+B),and cos (A+B),

1.5.4 tan(A+B) in terms of tan A and tan B

1.5.5 Formula for sin(A-B),cos (A-B) and tan(A-B).

1.5.6 Simple problems on compound angles.

MODULE-II TRIGONOMETRY-II

2.1 MULTIPLE AND SUBMULTIPLE ANGLES.

2.1.1 Multiple and sub multiple angles with examples.

2.1.2 Formulae for sin2A,cos2A and tan 2A (statements only)

2.1.3 Formulae for sin 3A, cos 3A (statements only)

2.1.4 Simple problems on multiple angles (problems involving half angle formulae are excluded)

2.2 SUM OR DIFFERENCE FORMULAE AND CONVERSE

2.2.1 Expressions for sinC ± sinD and cosC ± cosD in terms of Product of trigonometric ratios.

2.2.2 Expressions for sinAcosB, cosAsinB, cosAcosB and sinAsinB in terms of the sum and difference of trigonometric ratios.

2.2.3 Simple problems.

2.3 PROPERTIES AND SOLUTION OF TRIANGLES.

2.3.1 The relation between sides of a triangle and Sines, Cosines and Tangents of any angle

2.3.2 Sine rule, Cosine rule and Tangent rule-(statements only.) ,

2.3.3 Projection formulae in any triangle.(no proof)

2.3.4 Simple problems on above rules.

2.3.5 Solution of a triangle in the following cases when

(i) All the three sides are given

(ii) Two sides and included angle are given

(iii) Two angles and one side is given

2.3.6 Area of a triangle (Formulae and simple problems, no proof) when,

(i) All the three sides a, b and c are given

(ii) Two sides and one included angle are given

MODULE-III DIFFERENTIAL CALCULUS

3.1 FUNCTIONS AND LIMITS.

3.1.1 Variables and Constants.

3.1.2 Dependent and independent variables.

3.1.3 Definition of a function

3.1.4 Explicit and implicit functions

3.1.5 Concept of limit of a function (intuitive idea only).

3.1.6 Need for this concept in finding instantaneous rate of change like velocity and slope.

3.1.7 Explanation of $\lim_{x\to 0} \frac{1}{x} = \infty$ and $\lim_{x\to\infty} \frac{1}{x} = 0$,

3.1.8 Simple problems on evaluation of limits of functions

(i) When x tends to 'a'

(ii) By factorization,

(iii) When x tends to '∞'

3.1.9 Algebraic and trigonometrical limits:-

$$1)\ \lim_{x\to a}\frac{x^n - a^n}{x-a} = na^{n-1} \text{ for any rational number.}$$

$$2)\ \lim_{\theta\to 0}\frac{\sin\theta}{\theta} = 1 \quad \text{where } \theta \text{ is in radians}$$

3.1.10 Simple problems on evaluation of limits based on direct application of the above standard limits.

3.2 DIFFERENTIATION-I

3.2.1 Increment and incremental ratio.

3.2.2 Differential coefficient or derivative of a function.

3.2.3 Derivatives of functions of x^n, sinx,and cosx with respect to 'x' from method of first principles

3.2.4 List of standard derivatives.

3.2.5 Derivatives of e^x and log x (no proof).
3.2.6 Derivatives of inverse trigonometric functions (no derivation)
3.2.7 Rules of differentiation: Sum, product and quotient of functions.
3.2.8 Simple problems based on these rules.

3.3 DIFFERENTIATION-II

3.3.1 Derivatives of function of a function (Chain rule).
3.3.2 Problems based on chain rule.
3.3.3 Differentiation of Implicit functions and Parametric functions.
3.3.4 Simple problems on differentiation of implicit functions and parametric functions.
3.3.5 Successive differentiation up to second order.
3.3.6 Problems on successive differentiation.

MODULE-IV APPLICATIONS OF DIFFERENTIAL CALCULUS

4.1 EQUATIONS OF TANGENTS AND NORMALS

4.1.1 Geometrical meaning of derivative
4.1.2 Slope of a curve at a point.
4.1.3 Equations of tangent and normal to the curve y = f(x) at a given point.

4.2 RATES AND MOTION

4.2.1 Derivative as a rate measurer
4.2.2 Simple problems of rates occurring in engineering..
4.2.3 Velocity and acceleration
4.2.4 Simple problems to find velocity and acceleration of a moving body 13.5 when displacement 's' is given in terms of 't' and related problems
4.2.5 Problems to determine the rate of change of a variable, when the rate of change of some related variable is given.

4.3 MAXIMA AND MINIMA

4.3.1 Increasing and decreasing functions.
4.3.2 Conditions for maxima and minima.(No proof)
4.3.3 Maxima and minima of a function.
4.3.4 Simple direct problems on maxima and minima.

CONTENTS DETAILS

MODULE - I

1.1 ANGLES

Definition of an angle, Concept of an angle in trigonometry Different systems of measuring an angle, Definition of degree and radian, Express a right angle in different systems,
Relation between degree & radian.

1.2 TRIGONOMETRIC RATIOS.

Definition of Trigonometric ratios, Trigonometric identities. (Statements only), Problems based on trigonometric identities, Trigonometric ratios of standard angles like 0^0, 30^0, 45^0, 60^0 and 90^0.Problems.

1.3 TRIGONOMETRIC RATIOS OF RELATED ANGLES

Angle of any magnitude and sign, positive and negative angles

Trigonometric ratios in different quadrants and signs

ASTC-Rule, Complementary angles and relation between trigonometric ratios of complementary angles.

Signs of trigonometric functions of related angles, Given a trigonometric functions of an angle and its quadrant find others Formulae of 90± □, 180± □, 270± □, 360± □ and (-□), Problems on related angles, Evaluation of sin 120 ,cos 330, tan 315

1.4 HEIGHTS AND DISTANCES

Angle of elevation and angle of depression. Simple problems

1.5 COMPOUND ANGLES.

Compound angles, Examples, Addition and subtraction formulae, Expression of tan(A+B) in terms of tanA and tanB, Simple problems on compound angles.

MODULE - II

2.1 MULTIPLE AND SUBMULTIPLE ANGLES.

Multiple and sub multiple angles with examples, Formulae for sin2A,cos2A,tan2A,Sin3A,Cos3A(without proof), problems on multiple angles (problems involving half angle formulae are excluded)

2.2 SUM OR DIFFERENCE FORMULAE AND CONVERSE

Sum, Difference, product formulae, converse of product formulae (without proof) and simple problems based on it.

2.3 PROPERTIES AND SOLUTION OF TRIANGLES.

Sine rule, Cosine rule and Tangent rule-(statements only.), Projection formulae in any triangle.(no proof),Simple problems on above rules. Solution of a triangle when all the three sides are given ,two sides and included angle are given two angles and one side is given Area of a triangle (Formulae and simple problems, no proof) when all the three sides a, b and c are given & when two sides and one included angle are given

MODULE - III

3.1 FUNCTIONS AND LIMITS.

Variables and Constants. Dependent and independent variables Definition of a function Explicit and implicit functions, Concept of limit of a function, Explanation of $\lim_{x\to 0} \frac{1}{x} = \infty$ and $\lim_{x\to\infty} \frac{1}{x} = 0$, Simple problems on evaluation of limits of functions(i) when x tends to 'a'(ii) by factorization, (iii) when x tends to '∞' Algebraic and trigonometrical limit(without proof) and simple problems based on it

3.2 DIFFERENTIATION-I

Increment and incremental ratio, derivative of a function, Derivatives of functions of x^n, sinx and cosx with respect to 'x' from method of first principles, List of standard derivatives. Derivatives of e^x ,log x & Derivatives of inverse trigonometric functions (no derivation), Rules of differentiation: Sum, product and quotient of functions. Simple problems based on these rules.

3.3 DIFFERENTIATION-II

Derivatives of function of a function (Chain rule).Problems based on chain rule. Differentiation of Implicit functions and Parametric functions.

Simple problems on differentiation of implicit functions and parametric functions,

Successive differentiation up to second order. Problems on successive differentiation.

MODULE - IV

4.1 EQUATIONS OF TANGENTS AND NORMALS

Geometrical meaning of derivative Slope of a curve at a point.

Equations of tangent and normal to the curve y = f(x) at a given point.

4.2 RATES AND MOTION

Derivative as a rate measurer, Simple problems of rates occurring in engineering, Velocity and acceleration, Simple problems to find velocity and acceleration of a moving body when displacement 's' is given in terms of 't' and related problems. Problems to determine the rate of change of a variable, when the rate of change of some related variable is given.

4.3 MAXIMA AND MINIMA

Increasing and decreasing functions. Conditions for maxima and minima.(No proof) Maxima and minima of a function. Simple direct problems on maxima and minima

NB: Emphasis is given in application oriented problems and hence proofs and derivations are not expected.

Text Book:

Engineering Mathematics-I for polytechnic colleges by different authors.

Reference Books:

Anton - Calculus, 7 edn. - WILEY

Dr.M.K.Venkatraman - Engineering Mathematics - National Publishing Co, Chennai

Dr.P.Kandasamy & Others - Engineering Mathematics - S.Chand & Co Ltd, New Delhi

COURSE TITLE : ENGINEERING PHYSICS I
COURSE CODE : 1003
COURSE CATEGORY : F
PERIODS PER WEEK : 3
PERIODS /SEMESTER : 45
CREDITS : 3

TIME SCHEDULE

Module	Name of Module	Course Objective Number	Total periods per Semester		
			Instructional	Test	Total
I	Force and Motion	1.1 - 1.4	10	1	11
II	Vectors and Statics	2.1 - 2.2	12	1	13
III	Properties of Matter	3.1 - 3.4	11	1	12
IV	Periodic Motion and Waves	4.1 - 4.3	8	1	9
	TOTAL		**41**	**4**	**45**

COURSE OUTCOME

After the completion of the course student will be able to

- Differentiate different Physical quantities and its standard units.
- Understand concepts of force, Linear momentum, etc. which helps him to extend these concepts to Engineering mechanics.
- Solve fundamental problems in Mechanics related to force and its effects.
- Understand the fundamental principles of Rocket propulsion.
- Work with various vector algebraic tools which help to understand various concepts of Physics and technology.
- Acquire broad ideas about resultant force, moment of force and moment of a couple.etc. enables to perform vector operations and interpret the results geometrically and understand the applications in various Engineering branches.
- Understand basic ideas of different types of modulii of elasticity with special reference to Young's Modulus.
- Study concepts of technical terms such as stress, strain, elastic limit, elastic fatigue, plastic material etc
- Get an introductory idea of liquid flow with special reference to Bernoulli's theorem leading to its practical applications
- Impart basic ideas of viscosity and its practical applications

- Inculcate qualitative and quantitative knowledge of Simple Harmonic Motion.
- Contemplate basic concepts of wave motion and its characteristics leading to the understanding of various types of applications such as vibrations of air column.
- Recognise the characteristics of Ultrasonic sound and hence to apply the same in various applications in the field of Engineering and technology.

Specific Outcome

MODULE - I FORCE AND MOTION

1.1.0 Understand the concept of units and measurements.
1.1.1. Define Unit of a Physical quantity.
1.1.2. Explain the principle of measurement.
1.1.3. Identify fundamental and derived units.
1.1.4. Apply the dynamics of particles in practical situations.
1.1.5. Identify the vector and scalar quantities.
1.1.6. Derive the expression $S_n = u + a (n-½)$.
1.1.7. Solve problems related to gravity with equations of motion.
1.1.8 State Newton's laws of motion.
1.1.9 Define the terms force, Inertia, Momentum and Impulse.
1.1.10 Derive the relation F = ma.
1.1.11 State law of conservation of momentum and prove it in the case of two bodies making a collision .
1.1.12 Explain the principle behind the recoil of gun.
1.1.13 Solve problems related to laws of motion.

MODULE - II VECTORS AND STATICS

2.1.0 Understand the principles of statics and its applications.
2.1.1 Add vectors using triangle method.
2.1.2 Define Resultant and Equilibrant of vectors.
2.1.3 State Parallelogram law of forces.
2.1.4 Derive expression for resultant using Parallelogram law.
2.1.5 State the law of triangle of forces.
2.1.6 State Lami's theorem.
2.1.7 Explain moment of a force.
2.1.8 State the conditions of equilibrium of a rigid body acted upon by a large number of coplanar parallel forces.
2.1.9 Derive expression for work done by a couple.

MODULE - III PROPERTIES OF MATTER

3.1.0 Comprehend the concept of elasticity.
3.1.1 Define stress, strain, and elastic limit.
3.1.2 State Hooke's law.
3.1.3 Derive expression for Young's modulus, rigidity modulus, and bulk modulus.
3.1.4 Understand the term elastic fatigue.

3.1.5 Solve the problems related to modulus of elasticity.
3.1.6 Understand the principle of fluid flow.
3.1.7 Distinguish between Streamline and Turbulent flow.
3.1.8 Explain Pressure energy, Kinetic energy and Potential energy of a liquid.
3.1.9 Mention equation of continuity.
3.1.10 State Bernouille's theorem.
3.1.11 Explain the working of airfoil and atomizer.
3.1.12 Apply the principle of viscosity in solving problems.
3.1.13 Define coefficient of viscosity.
3.1.14 Give the Poiseusille's formula.
3.1.15 Explain terminal velocity.
3.1.16 Mention Stoke's formula.
3.1.17 Explain the effect of temperature on viscosity.
3.1.18 Solve problems using Poiseuille's formula.

MODULE - IV PERIODIC

4.1.1 Comprehend the concept of wave motion.
4.2.0 Define Simple Harmonic motion.
4.2.1 Derive equation for simple harmonic motion.
4.2.2 Explain period, frequency and amplitude.
4.2.3 Distinguish between transverse and longitudinal waves.
4.2.4 Define wavelength.
4.2.5 Derive the relation $v = f\lambda$
4.2.6 Explain resonance.
4.2.7 Distinguish between closed pipes and open pipes.
4.2.8 Calculate the velocity of sound using resonance column experiment.
4.2.9 Explain ultrasonic waves.
4.2.10 Mention applications of ultrasonic waves.

COURSE CONTENT

MODULE - I FORCE AND MOTION (11Hrs)

Physical Quantities – units - fundamental and derived units - SI System and its advantages- One dimensional motion- Scalar and vector quantities - speed- velocity- acceleration - recapitulation of equations of motion - derivation of the formula $S_n = u + a(n-½)$ - motion under gravity - problems.

Force and motion - linear momentum - Newton's laws of motion - derivation of F = ma law of conservation of momentum - derivation - recoil of gun - expression for recoil velocity rocket propulsion - impulse - problems.

MODULE - II VECTORS AND STATICS (13Hrs)

Vectors and scalars- Triangle method of vector addition- Concurrent forces- Resultant and Equilibrant- parallelogram law –Derivation of resultant in magnitude and direction-Law of triangle of forces- Lami's theorem- Resolution of forces- Parallel forces- like and unlike parallel forces- moment of a force- conditions of equilibrium under the action of a number of coplanar parallel forces- couple-moment of a couple- work done by a couple- numerical problems.

MODULE - III PROPERTIES OF MATTER (12Hrs)

Elasticity – stress – strain - elastic limit. Hook's law - Young's modulus - rigidity modulus - bulk modulus – determination of Young's modulus by stretching - elastic fatigue – plastic – problems.

Fluid flow- streamline and turbulent flow- pressure energy, potential energy and kinetic energy of a liquid- equation of continuity –Bernoulli's theorem – applications- airfoil and atomizer.

Viscous force- coefficient of viscosity- Poiseulle's formula – Stoke's formula and experiments – Variation of viscosity with temperature – numerical problems

MODULE - IV PERIODIC MOTION AND WAVES (9Hrs)

Simple harmonic motion – definition – simple harmonic motion as projection of a uniform circular motion along the diameter of a circle – equation for simple harmonic motion – period, frequency, amplitude and phase –Examples of simple Harmonic Oscillators - problems.

Waves – longitudinal and transverse – relation between velocity, frequency and wavelength – free vibration, forced vibration and resonance – nodes and antinodes - vibration of air column in a tube – closed pipes – open pipes – end correction – resonance column experiment – variation of velocity with temperature – ultrasonic waves – production – applications - problems.

REFERENCE BOOKS

1. Resnick and Halliday - Physics
2. D.S.Mathur - Mechanics
3. Narayana Kurup - Mechanics
4. A.Marikani - Engineering Physics
5. H D Young - University Physics

COURSE TITLE : ENGINEERING CHEMISTRY I
COURSE CODE : 1004
COURSE CATEGORY : F
PERIODS PER WEEK : 3
PERIODS /SEMESTER : 45
CREDITS : 3

TIME SCHEDULE

Module	Name of Module	Course Objective no.	Total periods per semester		
			Instructional	Test	Total
I	Atomic Structure-I, Nanochemistry and Catalysis	1.1 1.2 1.3	Theory : 13	1	14
			Practical		
II	Fundamental of analytical chemistry	2.1 2.2 2.3	Theory : 11	1	12
			Practical		
III	Water and its treatment.	1.1 1.2 1.3	Theory : 8	1	9
			Practical		
IV	Metals and Alloys	1.1 1.2 1.3	Theory : 9	1	10
			Practical		
TOTAL					**45**

Course Outcome

After the completion of the course, student will be able to

- Understand the concept of atom
- Prepare the students to learn the advanced level of Science and Technology like Nanotechnology.
- Relate the knowledge of basic chemistry in industrial applications like Catalysis
- Understand different concepts of acids and bases
- Analyse the physical concepts related to pH and develop the skill of solving problems
- Develop the ability to analyse, interpret and apply the fundamentals of analytical chemistry including the skill of solving problems
- Distinguish different types of water and hardness. Predict the methods of removal of hardness and apply the basic principles of chemistry behind it and apply the learned facts in real life situation.

- Differentiate between metals and alloys
- Apply the concept of metals and alloys in metallurgy.

Specific Outcome

MODULE - I:

1.1.0 ATOMIC STRUCTURES I, NANO CHEMISTRY AND CATALYSIS

1.1.1. Review the fundamental particles of atom

1.1.2. Explain the terms nano materials and nanotechnology.

1.1.3. Explain different methods of synthesis and applications of carbon nanotubes.

1.1.4. Introduce different terms used in catalysis.

MODULE - II :

1.2.0 FUNDAMENTALS OF ANALYTICAL CHEMISTRY

1.2.1. Recollect the ideas of acids and bases.

1.2.2 Narrate the different definitions of acids and bases and compute equivalent weights of acids and bases.

1.2.3 Explain the terms Ionic product of water,' pH, pOH and Buffer Solution and illustrate Calculation of pH and pOH.

1.2.4 Explain the strength of solution using molarity and normality.

1.2.5 Solve problems based on normality and molarity.

1.2.6 Explain different terms used in Volumetric analysis.

1.2.7 Understand the principle of volumetric analysis and Solve problems based on $N_1V_1=N_2V_2$.

MODULE - III:

1.3..0 WATER AND ITS TREATMENT

1.3.1. Understand soft and hard water- definition and causes

1.3.2 Distinguish between soft and hard water

1.3.3 Mention types of hardness

1.3.4 Explain methods of removal of hardness

1.3.5 Explain reverse osmosis and desalination of sea water

MODULE - IV:

1.4.0 METALS AND ALLOYS

1.4.1 Distinguish the different varieties of Iron with their properties

1.4.2 Explain different methods of heat treatments of steel

1.4.3 Introduce alloys and explain composition of alloys like brass, bronze, Duralumin and Solder

1.4.4 Explain Powder Metallurgy with different steps, uses, advantages and limitations

CONTENT DETAILS

MODULE - I: Atomic Structure I, Nano Chemistry and Catalysis (13+1 = 14 hour)

Definition of atom and molecule - Fundamental particles - Electron, Proton and Neutron. Their charge and mass - Atomic number, mass number.

Definitions of nano materials and nano technology – Applications of nano materials – Carbon nano tubes – Types of Carbon nano tubes – SWCNT and MWCNT – Synthesis, Properties and any five applications of Carbon nano tubes.
Catalysis – Definition of Catalyst – Terms – Positive Catalyst, Negative Catalyst, Promotors and poisons with one example each - Types of Catalysis – Homogeneous Catalysis and Heterogeneous Catalysis – Two example each (No mechanism is required).

MODULE - II: Fundamentals of Analytical Chemistry (11+1 = 12 hour)

Definitions of Acids and Bases – Arrhenius, Bronsted & Lowry and Lewis definitions – Conjugate acid – base pair with two examples – Basicity of acid and Acidity of base – Equivalent weights of acids and bases.

Ionic Product of water – pH and pOH scale Definition – relation between pH and pOH – Simple problems based on pH. Applications of pH – Buffer solution – definition – classification of Buffers – Acidic and Basic Buffers – Buffer Capacity (definition only).
Molarity and Normality – Definition and mathematical formulae – Simple problems based on molarity and normality – Volumetric analysis – Titration – end point – indicators – pH range of indicators – choice of indicators in titration – Principle of Volumetric analysis (Normality equation only). Simple problems based on normality equation.

MODULE - III: Water and its Treatment (8+1=9 hour)

Water - Physical properties of water – Soft water and hard water – Reasons of hardness – Types of hardness – temporary hardness and permanent hardness – removal of temporary hardness – Boiling and Clark's Process – Removal of permanent harness – Ion exchange process using Cation and Anion exchangers - Potable water – Characteristics and treatment with block diagram - Desalination of sea water – reverse osmosis.

MODULE - IV: Metals and Alloys (9+1=10 hours)

Physical properties of metals – Properties of Industrial metals like Cast Iron, Pig Iron, Wrought Iron and Steel (Manufacture is not required) – Effect of Impurity in Steel – Heat Treatment of Steel – Tempering, Quenching and Nitriding – Alloys – Definition – Purpose of making alloys – Preparation of alloys by fusion method (figure is required) – Composition of alloys like Brass, Bronze, Duralumin and Solder – Powder Metallurgy (1. Preparation of Metal Alloy by Atomization and Reduction. 2. Chemical Mixing or Blending. 3. Compacting. 4. Pre-Sintering. 5. Sintering.) and its uses, advantages and limitations.

REFERENCE:

Sl. No.	Name of Author	Title of Book	Name of Publisher
1	Jain and Jain	Engineering Chemistry	Dhanpat Rai and Sons
2.	S. S. Dara	Engineering Chemistry	S. Chand Publication
3.	B. K Sharma	Industrial Chemistry	Geol Publication
4.	S. S. Dara	Environmental Chemistry and Pollution Control	S. Chand Publication
5.		Wiley “All in One”	Wiley India Pvt. Ltd 2012 Editon.

COURSE TITLE : ENGINEERING GRAPHICS
COURSE CODE : 2005
COURSE CATEGORY : F
PERIODS/ WEEK : 5
PERIODS/ SEMESTER : 75
CREDIT : 0

TIME SCHEDULE

MODULE	TOPIC	PERIODS
1	Introduction of engineering graphics Lettering, numbering and dimensioning	19
2	Geometric construction & Scales	21
3	Projections of points and lines	18
4	Projections of planes	17
TOTAL		**75**

COURSE OUTCOME:

After the completion of the course, student will be able to

- Understand the importance of engineering graphics
- Recognise the use of drawing instruments, standards, symbols etc.
- Appreciate the lettering, numbering , dimensioning
- Recognise geometric construction & Scales
- Understand the projections of points ,lines etc.
- Understand the projections of planes

SPECIFIC OUTCOME:

MODULE - I

1.1.0 Understand the importance of engineering graphics

1.1.1 Understand the importance of engineering graphics
1.1.2 Explain the importance of engineering communication medium
1.1.3 Describe the development of engineering graphics and computer aided drafting CAD
1.1.4 Indicate the link between engineering graphics and other subjects of study in diploma courses

1.2.0 Recognise the use of drawing instruments

1.2.1 Use engineering drawing instruments
1.2.2 Select the proper instrument to draw horizontal, vertical and inclined lines
1.2.3 Select the proper instrument to draw large and small circles and arcs to its specifications
1.2.4 Select the proper pencil to draw different types of line according to its specifications
1.2.5 Identify the steps to keep the drawing clean and tidy

1.3.0 Recognise the use of drawing standards, symbols etc

1.3.1 Appreciate the standards of engineering drawing
1.3.2 Select the drawing sheet
1.3.3 Draw different types of lines
1.3.4 Prepare title block as per BIS
1.3.5 Fold drawing sheets as per standards

1.4.0 Appreciate the lettering & numbering

1.4.1 Apply lettering and numbering
1.4.2 Write drawing title using sloping and vertical lettering including numerals as per BIS
1.4.3 Select suitable size of letters of different layout and applications
1.4.4 Write engineering drawings notes using lettering

1.5.0 Appreciate the dimensioning

1.5.1 Apply dimensioning as per standards
1.5.2 State the need of dimensioning as per BIS specification
1.5.3 Identify the notations used in a drawing as per BIS
1.5.4 Identify the system of placement of the dimensions as per BIS
1.5.5 Dimension of a given drawing according to BIS including features
1.5.6 Apply the rules for dimensioning of standard features, given a drawing comprising of standard features
1.5.7 Identify the principles of dimensioning, given a dimensioned drawing
1.5.8 Identity the correctness of an engineering drawing dimensioned and dimension the same as per BIS

MODULE - II

2.1.0 Recognise Geometric construction

2.1.1 Apply principles of geometrical construction
2.1.2 Construct polygon, given the length of the side
2.1.3 Insert a regular polygon in a circle.
2.1.4 Define Ellipse, involutes, helix, Parabola, Hyperbola and Cycloid,
2.1.5 Construct Ellipse by concentric circle, eccentricity, rectangular and parallelogram methods

2.1.6 Construct an involute, helix, parabola from given data
2.1.7 Identify the application of these constructions in engineering practice.

2.2.0 Recognise Scales

2.2.1 Know about the importance of scale in Engineering Drawing
2.2.2 Identify different types of Scales

MODULE - III

3.1.0 Understand the projections of points & lines

3.1.1 Understand the projection of points, lines and planes
3.1.2 Project points in different quadrants
3.1.3 Project lines parallel to both planes
3.1.4 Project lines perpendicular to HP and || to VP
3.1.5 Project lines perpendicular to VP and || to HP
3.1.6 Project lines inclined to HP and || to VP
3.1.7 Project lines inclined to VP and || to HP
3.1.8 Project lines inclined to both planes - simple direct questions and answers
3.1.9 Find true length of lines

MODULE - IV

4.1.0 Understand the projections of planes

4.1.1 Project planes parallel to VP and perpendicular to HP
4.1.2 Project planes parallel to HP and perpendicular to VP
4.1.3 Project planes inclined to one plane and parallel to other

CONTENT DETAILS

MODULE - I

1.1 The Importance of Engineering Graphics

Explanation of the scope and objective of this subject – its importance as a graphic communication- Computer Aided Drafting (CAD) need for preparing drawing as per BIS standards.

1.2 Drawing Instruments.

Basic drawing instruments – T square – Set square – compass - dividers – drawing boards – Pencils – Drawing papers – Mini drafter – French curves – Stencils – Selection and mode of using them.

1.3 Drawing Standards

Size of drawing sheets – Layouts of drawing sheet – Title Blocks – Types of lines – Folding of drawing sheets

1.4 Free hand Lettering and Numbering

Need for legible lettering and numbering on drawings – selection of suitable size of lettering for different drawing writing of Engineering drawing titles and notes using both vertical and sloping styles.

1.5 Dimensioning

Function of dimensioning - need for dimensioning engineering drawing according to BIS – notation used in dimensions – dimension line – extension line – arrow heads and leader – system of dimensioning (method I and method II)

MODULE - II

2.1 Geometric construction

Construction of regular polygon given the length of its side - methods of inserting a regular Polygon in a given circle – construction of ellipse by different methods – eccentricity - concentric circle- rectangular and parallelogram. Definition of involute - helix - parabola & hyperbola – construction of cycloid- helix- involute and parabola.

2.2 Scales

Meaning of drawing to scale – reduced scale – enlarged scale – full size scale – types of scale – plain scales & diagonal scales – dividing a line into number of equal parts

MODULE - III

3.1 Projection of points- lines and planes

Projection of points in different quadrants-

Projection of straight lines(in first quadrant only) - parallel to one or both planes - parallel to one plane and perpendicular to other – inclined to one plane and parallel to other - inclined to both planes. Methods of finding true length and its inclination with the reference planes.

MODULE - IV

4.1 Projection of planes

Projection of planes (in first quadrant only) – perpendicular to both planes - parallel to one plane and perpendicular to other plane - inclined to one plane and perpendicular to the other plane

TEXT BOOKS

1. K. C Jon, - Engineering Graphics - PHI Learning Private Limited
2. P. I. Varghese - Engineering Graphics - VIP Publishers

REFERENCE BOOKS

1. N D Bhatt - Engineering Drawing
2. Sageer& Abu - Engineering Graphics
3 M. B. Shah and B.C.Rana - Engineering Drawing - Pearson Publications
4**.** T.Jayapoovan - Engineering Drawing & Graphics using Autocad – Vikas publications

COURSE TITLE : HEALTH & PHYSICAL EDUCATION
COURSE CODE : 1009
COURSE CATEGORY : C
PERIODS/WEEK : 3 (1 Theory +2 Practical)
PERIODS/SEMESTER : 45
CREDITS : 2

***Objective*:** The course intended to provide learning experience to students to realize the importance of physical fitness, health and well being. It will also help to develop life time physical activity behaviour among the students. The course will help,

1. To introduce the fundamentals of health, physical education, fitness and sports.
2. To provide knowledge and understanding regarding the scientific basis of fitness.
3. To enable the students to lead a healthy lifestyle based on concepts of fitness and wellness.
4. To impart knowledge regarding health and nutrition; and to equip the students to provide first aid measures and manages common injuries.

Health and Physical Education (Theory) – 15 Sessions

TIME SCHEDULE		
MODULE	**TOPIC**	**PERIODS**
I	Concept of Health and Physical Education	6
II	Introduction to fitness	18
III	First Aid	9
IV	Food and Nutrition	6
	Test	6
TOTAL		45

MODULE – I CONCEPT OF HEALTH AND PHYSICAL EDUCATION

a) Health – Definition and spectrum of health
b) Various aspects of health-physical health, mental health, social health, spiritual health
c) Factors influencing health-Biological factors, environmental factors, socio-cultural factors, Personal factors.
d) Physical Education - Meaning and definition, aims, objectives and importance of physical education

MODULE - II INTRODUCTION TO FITNESS

a) Meaning and importance of physical fitness.
b) Components of physical fitness-Health related and skill related fitness.

c) Means of fitness development-aerobic and anaerobic activities, sports and games, yoga and recreational activities.
d) Principles of use and disuse. Relationship between duration and severity of exercise – stitch, cramps. Oxygen debt and second wind
e) Posture- Meaning and concepts of posture, classification of posture- Endomorph, Ectomorph and Mesomorph, Dynamic postures- sitting,standing, walking, running, lying,- Postural deformities- Kyphosis, Lordosis, Scoliosis, Knock knee, Bow leg, Flat foot.
f) Health risk behaviours- Effects of Drugs, Alcohol, Smoking, Dietary abuse and Inactivity.

MODULE - III FIRST AID

a) Definition and purpose of first aid Principles and Ethics of First Aid
b) First Aid – General Procedure -first aid kit.
c) Wounds (types and its management)
d) Fractures (types and its management)
e) First aid for –burns, snake bite, drowning, unconsciousness, electric shock, chocking, sun stroke, bleeding.
f) Bandaging techniques
g) Techniques of carrying injured persons.
h) Cardiopulmonary resuscitation (CPR).

MODULE - IV FOOD AND NUTRITION

a) Classification of food
b) Calories and daily requirement of calories.
c) Balanced diet
d) Food pyramid
e) Caloric value of Indian foods

SUGGESTED READINGS

1**) AAPHERD**. ***Health Related Physical Fitness test Mannual***.1980 published by association drive Reston Virginia
2**) ACSM** ***Fitness Book***, Leisure Press Campaign, Illinois,1996, Leisure Press , Canada
3) **ACSM**'s ***"health related physical fitness assessment manual"*** Lippincott Williams and Wilkins USA, 2005
4) **B.C. Rai** ***Health Education and Hygiene,*** published by Prakashan Kendra,Lucknow
5) **Corbin, Charles B.et.al, C.A.,(2004).** ***Concepts of Fitness and Wellness,*** Bosten:McGrawHill
6**) Fashey,TomasD,Insel, Paul M, and Roth, Walton T (2005)** ***Fit and well,*** New York: McGrawHill Inc.

7) **Greenberg, Jerold S and Dintiman George B (1997)** ***welness- Creating a Life of Health and fines*** London: Allyn and Bacon Inc.
8) **Norman Bezzant*****Help First Aid for everyday emergencies,*** JaicoPublishing House Bombay, Delhi
9) **Puri,K, Cahndra.,S,S, (2005).** ***Health and Physical Education***. New Delhi: Surjeet Publication

Health and Physical Education (Practical) – 15 Sessions (2 Hours/session)		
PART- I	**COMPULSORY**	**09 SESSIONS**
1	Warming Up and warming down(Various Stretching and Rotation Exercises)	1
2	Aerobic dance and various flexibility exercises	1
3	Yoga – Pranayama – Surya Namaskar-Padmasana- Pachimothasana- Bhujangasana- Dhanurasana - Sarvangasana -Matsyasana- SalabhasanHalasana- Chakrasana- Vrikshasana- Padahastasana - Savasana	3
4	Weight Training – Biceps curls- Triceps curls- Lateral rise- Good morning- Wrist curl- Front press- Press behind the neck- Bench press- Upright rows- Leg presses- Half Squat- Full squat- Dumbbell exercises	2
5	Physical Fitness Test yard dash -- Speed anding Broad Jump-Leg Power -Ups (60 sec) -Abdominal strength uttle Run(10mts x 4)-Agility ll –ups(M)Flexed arm hang(W) –Shoulder strength 0 yard/walk-Endurance	2
PART- II	**OPTIONAL**	**06 SESSIONS**
1	Students can opt any one activity from two disciplines suggested by the faculty subject to the availability of facilities at the college	3
2	1. Football, 2. Basketball, 3. Volleyball, 4. Shuttle Badminton, 5. Ball Badminton, 6. Kabaddi, 7. Cricket, 8. Table Tennis, 9. Track and Field	3

Assessment of Students

Health and Physical Education			
	Internal	**External**	**Total**
Theory	40	00	40
Practical	10	50	60

a) Internal Assessment for Theory Course

The weightage of internal continuous assessment marks for theory courses shall be as follows:-

SL.NO.	Criteria Component	Weightage (%)
1	Test papers	50
2	Assignment (Minimum 2)	25
3	Attendance	25

b) Internal Assessment for Practical Course

The weightage of internal continuous assessment marks for practical courses shall be as follows:-

SL. No.	Criteria Component	Weightage (%)
1	Physical Fitness Test	50
2	Sports and games performance	50

c) Assessment at End of Semester Examination (Practical Course)

1) The course teacher and an examiner appointed by the Principal shall conduct the practical examination at the end of the semester.

2) Award of marks for the semester practical examinations as follows:-

SL. No.	Criteria Component	Weightage (%)
1	Fair Record	40
2	Viva Voce	20
3	Performance in Yoga	20
4	Demonstration of Weight Training Exercises	10
5	Demonstration of Aerobics, Stretching, Rotation and Flexibility exercises	10

COURSE TITLE : WORKSHOP PRACTICE
COURSE CODE : 2008
COURSE CATEGORY : F
PERIODS/ WEEK : 3
PERIODS/ SEMESTER (I & II): 90
CREDIT : 3

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Carpentry, Foundry & Casting	27
2	Smithy, Forging & Fitting	27
3	Sheet metal	18
4	welding	18
TOTAL		90

Course outcomes:

STUDENT WILL BE ABLE TO:

- Perform various exercises on given drawing and specifications in Carpentry shop, Foundry & Casting shop.
- Perform various exercises on given drawing and specifications in Smithy, Forging & Fitting shop.
- Perform various exercises on given drawing and specifications in Sheet metal shop.
- Perform various exercise on given drawing and specifications in Welding shop.

CONTENT DETAILS

MODULE I

Introduction, objectives, safety in the Carpentry shop, Foundry & Casting shop.
Familiarization of tools
Marking and measuring tools such as straight edge- meter square- try square- bevel square- combination square- marking knife- marking gauge- mortise gauge- cutting gauge- wing compares- trammel- divider- outside and inside calipers- spirit level and plumb bob.
Cutting tools such as Rip saw- Cross cut saw- panel saw- tenon saw- bow saw- compass saw- key hole saw- firmer chisel- bevel edge firmer chisel- parting chisel- mortise chisel- jack plane- wooden and metal- trying plane- smoothening plane- rebate plane- plough plane- router plate- spoke shave.
Boring tools such as Bradawl ratchet brace- wheel brace- shell bit- fostries bit- counter sunk bit.
Striking tools such as mallet etc
Holding devices – Bench vice- bench stop- sash clamp- G-clamp- hard screw.
Miscellaneous tools – Rasp cut file- scraper- glass paper- pincers- ratchet and cabinet type screw drivers.
Carpentry Practice

Marking- sawing- planning- chiseling- grooving- rebating exercises Preparation of carpentry joints.

Familiarization of Foundary tools

Hand tools – shovel- riddle- hammers- trowels- relic- lifters- strike off bar spruce- balloons- swab- gate cutter- mallet- vent rod- draw spike- lifting plate- pouring weight- gaggers- clamps, core & chaplets.

Moulding practice & casting

Preparation of moulding sand- Prepare moulds of different types using different patterns(single, double & three piece patterns)- ferrous & Non- ferrous metal casting using simple patterns.

MODULE II

Familiarization of Smithy tools

Hand tools – anvil- swage block- hammers such as ball peen- straight peen- cross peen and sledge hammers.Tongs such as flat- hallow- cold and hot chisels- swages- fullers- flatters- set hammers- pinch and drift.

Equipment: Open and closed hearth- heating furnaces- hand and power driven blowers- open and stock fire fuels such as charcoal- coal- oil and gas

Smithy & Forging Practice

Building fire in the furnace- Upsetting- bending- drawing- setting down- pinching- cutting and welding exercises

Familiarization of fitting tools

Hand tools & Marking tools – scriber- compass- dividers- outside and inside calliper- jenny calliper- ordinary scribing block- universal scribing block- angle plate- V-block- center punch- prick punch- try square- bevel square- surface plate- straight edge.

Cutting tools – chisels – flat- crosscut- half round- diamond point- side chisel. Files – single cut and double cut files rough- bastard- second cut- smooth Dead smooth files – flat- square- pillar- round triangular- half round- knife- safe edge and needle files.

Scribers – Neck saw – solid and adjustable frames – blades – cutting with point rack saw

Striking tools: Ball peen- straight peen- cross peen and double-faced hammers

Holding devices-vice-bench- leg- pipe- hand- pin and tool makers vice

Marking tools – scriber – ordinary and universal scribing block- center and prick punch.

Angle plate- v-block- Try Square- surface plate

Fitting Practice

Cutting - filing- scribing and simple joints exercises

MODULE III

Familiarization of Sheet metal tools

Understand safety precautions.

Familiarization of sheet metal tools – scribers- dividers- trammel points- set square- punches – prick Punches- centre punches – hand Grover- rivet- set- chisels hammers- riveting hammers- ball peen hammers – mallet- snip- shears- pliers- hand reamers (tongs) files- stakes. Measuring instruments in sheet metal folding rule- common rule- steel circumference rule- vernier calipers- micrometer- calipers- thickness gauges (SWG) sheet metal gauge.

Practice work

Sheet cutting- development- folding- bending and pipe bending- making right angle joints.

MODULE IV

Familiarization of welding tools & safety

Safety precautions- Study of various tools and equipments used in the welding shop for both arc welding and gas welding.

Practice work

1.D.C. arc welding

2.A.C. arc welding

3.Gas welding

4. Edge preparation of welded joint such as V and double V.

5.Horizontal -flat and vertical joints

General Information:

Examination in the Second Semester

TEXT BOOKS

1. **Mechanical Workshop Practice By K. C Jon, PHI Learning Private Limited**
2. **Mechanical Workshop & Laboratory Manual By K. C. John**

REFERENCE BOOKS

1. **S K Hajra Choudhary - Workshop Technology Vol. I**
2. **S K Hajra Choudhary - Workshop Technology Vol. II**

COURSE TITLE : COMPUTING FUNDAMENTALS (PRACTICAL)
COURSE CODE : 1008
COURSE CATEGORY : C
PERIODS/WEEK : 5 (2 THEORY+ 3 PRACTICAL)
PERIODS/SEMESTER : 75
CREDITS : 4

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Computer Fundamentals – Hardware and Software	14
2	Office Automation Tools	14
3	Basic Programming Concepts	22
4	Introduction to programming using python	25
	Total	**75**

COURSE OUTCOME:

On completion of the course the student will be able :

- Understand Computer Fundamentals – hardware and Software
- Understand computer networks
- Study Office automation tools
- Email and search engines
- Basic Programming Concepts
- Introduction to programming in Python

SPECIFIC OUTCOME

MODULE - I TO UNDERSTAND THE COMPUTER FUNDAMENTALS – HARDWARE AND SOFTWARE

1.1.1 Identify computer hardware and software (in the lab)
1.1.2 Draw and explain the block diagram of computer system
1.1.3 Demonstrate various peripherals and their applications.
1.1.4 Demonstrate the usage of various storage devices (data copying, CD/DVD burning)
1.1.5 Illustrate the booting procedure (using windows and linux)
1.1.6 Identify various operating system file management commands (create, copy, move, delete and rename folders and files)
1.1.7 Demonstrate installation of application software (in windows and linux)
1.1.8 Identify various computer languages
1.1.9 Differentiate the compiler and interpreters
1.1.10 State computer networks and internet**.**

MODULE - II TO APPLY OFFICE AUTOMATION TOOLS

2.1.1 Demonstrate how a document to be prepared and formatted
2.1.2 Demonstrate how a spread sheet to be prepared and calculations are performed
2.1.3 Demonstrate how presentations are prepared.
2.1.4 Demonstrate how to create email-id and uploading and downloading files.

MODULE - III TO UNDERSTAND BASIC PROGRAMMING CONCEPTS

3.1.1 Identify various problem solving steps
3.1.2 Design algorithm and flowchart for simple sequential problems.
3.1.3 Design algorithm and flowchart for control structures (decision making and iterative)

MODULE - IV TO DEVELOP PROGRAMS USING PYTHON

4.1.1 Demonstrate output functions and input function for a simple application
4.1.2 Modify the applications with inserting control logic (if, else, elif)
4.1.3 Modify the applications with inserting looping control(while, for)
4.1.4 Write programs for a simple total/average mark calculation and calculation of grade based on boundary conditions**.**

CONTENT DETAILS

List of Experiments :

1. Identify the internal and external hardware/peripheral components
2. Familiarisation with operating system along with file management commands like create, copy, move, delete and rename files and folders.
3. Prepare and print Bio-data with a covering letter using word processor.
4. Calculation of Total mark, grade based on boundary conditions for n number of students using Spread sheet.
5. Experiments for burning the contents in to optical disks.
6. Preparation of presentation (with transition and animations , insertion of scanned images and internet contents)
7. Email id creation, sending and receiving of email with attachments.
8. Programs to calculate average of 3 numbers, area of triangle, volume of cylinder, Temperature conversion.
9. Largest of 3 numbers, Check whether even or odd, Roots of quadratic equation, Character name of the day.
10. Print natural numbers, Factorial value, Multiplication table, Sum of digits, Sum of a set of numbers, calculation of grade based on boundary conditions

Text Book(s):

1. Rajaraman V. - Fundamentals of Computers - PHI

References:

1. Mrs. Chetna Shah & Mr. Kalpesh Patel - Open Office

Hardware Requirement : Desk Top Computer

Operating System.

COURSE TITLE : ENGINEERING SCIENCE LAB (For Semester I & II)
[Engineering Physics & Engineering Chemistry Lab]
COURSE CODE : 2007
COURSE CATEGORY : F
PERIODS PER WEEK : 3
PERIODS /SEMESTER (I & II): 90
CREDITS : 3

ENGINEERING PHYSICS LAB

TIME SCHEDULE

SL.No	Name of module	Course objective	Total period in 1 and 2 semester		
			Instructional	Test	Total
1	Measurement and calculation of different physical quantities	1:1 1:2 1:3	Practical: 42	3	45
Total periods 1 and 2 semester 45					

On completion of the course the student will be able to:

1. To measure volume of a cylinder using vernier calipers.
2. To measure volume of a wire using screw gauge.
3. To determine focal length of a convex lens by displacement method.
4. To determine the velocity of sound in air at room temperature using resonance column.
5. To determine spring constant using Hooke's law..
6. To determine acceleration due to gravity using simple pendulum.
7. To verify law of resistances.
8. To determine specific resistance of material using Meter Bridge.
9. To determine Internal Resistance of a Primary Cell using Potentiometer.
10. To plot characteristics of photoelectric cell (photoelectric current vs intensity of light and voltage applied)
11. To determine the mass of the given body using moment bar.
12. To determine the mass of a body by parallelogram method and by Lami's theorem.
13. To verify Ohm's law and to determine the resistance of the given wire.

14. To determine the coefficient of viscosity of a highly viscous liquid.
15. To determine the relative density using U- tube apparatus.

LIST OF PRACTICAL EXPERIMENTS – PHYSICS

1. Vernier calipers
2. Screw gauge
3. Convex lens
4. Resonance column
5. Hooke's law
6. Simple pendulum
7. Law of resistances
8. Meter bridge
9. Potentiometer
10. Photoelectric cell
11. Moment bar
12. Concurrent forces(mass of the body)
13. Ohm's law
14. Stoke's method for viscosity
15. U tube

ENGINEERING CHEMISTRY LAB

SL.No	Name of module	Course objective	Total period in 1 and 2 semester		
			Instructional	Test	Total
1	Quantitative analysis(Volumetric analysis)	1:1 1:2 1:3	Theory: Practical: 39	- 6	45
Total periods 1 and 2 semester 45					

TIME SCHEDULE

On completion of the course the student will be able to:

Practical Volumetric Analysis

Single Titration

1. Standardisation of HCL
2. Standardisation of NaOH Double Titrations
3. Estimation of NaOH
4. Estimation of KOH
5. Estimation of Na2 CO3
6. Estimation of K2 CO3
7. Estimation of HCl
8. Estimation of HNO3
9. Estimation of H2 SO4
10. Estimation of Oxalic acid
11. Standardisation of KMnO4
12. Estimation of Oxalic acid
13. Estimation of Fe 2+ ion
14. Estimation of Mohr's Salt
15. Determination of PH of Solution
16. Estimation of Zinc using EDTA
17. Estimation of Magnesium Using EDTA

Reference:

Prof. A. O. THOMAS – PRACTICAL CHEMISTRY – Eight Edition 2000

Diploma in Computer Engineering
Revision 2015
Syllabus
Semester - II

Semester II

S. No	Code	Course	Course Category	Periods per week			Credits	Type	Evaluation	
				Theory	Practical	Total			CA	External
1	2001	English for Communication II	F	2	2	4	3	T	50	100
2	2002	Engineering Mathematics II	F	6	0	6	6	T	50	100
3	2003	Engineering Physics II	F	3	0	3	3	T	50	100
4	2004	Engineering Chemistry II	F	3	0	3	3	T	50	100
5	2131	Programming in C	B	4	0	4	4	T	50	100
6	2005	Engineering Graphics	F	1	3	4	5	D	50	100
7	2008	Workshop Practice	F	0	3	3	3	P	50	50
8	2007	Engineering Science Lab II	F	0	3	3	3	P	50	50
9	2139	Programming in C Lab	B	0	3	3	2	P	50	50
10	2009	Life Skill	C	1	1	2	2	P	50	50
				20	15	35	34			

COURSE TITLE : ENGLISH FOR COMMUNICATION - II
COURSE CODE : 2001
COURSE CATEGORY : F
PERIODS/WEEK : 4
PERIODS/SEMESTER : 60
CREDITS : 3

MODULE	TOPICS	PERIODS
1	Relationships	15
2	Inspirations	15
3	Mysteries	15
4	Innovations	15
TOTAL		60

COURSE OUTCOME: To develop the four basic skills in English and use them effectively in day-to-day life.

SPECIFIC OUTCOME:

After completing the course the student will be able to:

- Read articles, essays and technical writings of various kinds and develop comprehension about the message, images, thoughts and ideas contained in these articles.
- Read short stories, poems, conversations and develop aesthetic sense and humanitarian ethos.
- Read various prose passages and develop skills in skimming and scanning.
- Understand the meaning of words used in passages by guessing meaning from the context.
- Develop curiosity about the different topics of current interest and express points of view.
- Familiarise themselves with different techniques of writing and use them effectively in business correspondences.
- Group and sequence ideas and exploit the potentials of cohesion and coherence.
- Acquire proficiency in correct usage of English words.
- Internalise correct pronunciation and use them in daily conversation.
- Develop communication skills by taking part in group discussions and present their views in a logical and convincing way.
- Learn different language functions like agreeing, permitting, apologizing, negating and the like and use them effectively in daily communication.
- Identify the different study skills and use them to improve their academic performance.

CONTENT DETAILS

MODULE - I

1. Reading passage - Relationships.
2. Vocabulary – Vocabulary acquisition through dictionaries.
3. Grammar – Connectors.
4. Writing – Letter Writing.
5. Language Function – Expressing one's opinion/Expressing likes & dislikes.
6. Speaking – Seminar Presentations.

MODULE - II

1. Reading passage - Inspirations.
2. Vocabulary – Vocabulary acquisition through developing reading skills.
3. Grammar – Using relative clauses.
4. Writing – Notices, Memos, Short Messages.
5. Language Function – Granting leave, Interrupting
6. Speaking – Attending Interviews.

MODULE - III

1. Reading passage - Mysteries.
2. Vocabulary – Learning words by association.
3. Grammar – Passive Voice.
4. Writing – Process Writing.
5. Language Function – Asserting/Making Suggestions.
6. Speaking – Conducting Meetings – Short Speeches.

MODULE - IV

1. Reading passage - Innovations.
2. Vocabulary – Confusing Words, Homophones.
3. Grammar – Reported Speech.
4. Writing – E-mails.
5. Language Function – Saying goodbye, Offering help.
6. Speaking – Describing the working of a machine.

PRACTICAL

Two hours are set apart for practical training in the use of English language. Here, stress is given to skills of listening and speaking. Accuracy and fluency are the two factors which are needed for our students. Practical sessions are intended to equip the learner to meet the everyday demand of the industry. Activities that can be used in the practical sessions are enlisted:

Speaking activities – Speaking with a friend, speaking to an audience, role play, group discussion, Just a Minute (JAM), Sharing of experience and ideas, Impromptu speeches.

REFERENCE: - G (A Coursebook in English for Polytechnic College Students – Semester II)

COURSE TITLE : ENGINEERING MATHEMATICS – II
COURSE CODE : 2002
COURSE CATEGORY : F
PERIODS/WEEK : 6
PERIODS/SEMESTER : 90
CREDITS : 6

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	VECTOR ALGEBRA BINOMIAL SERIES	14 10
2	DETERMINANTS MATRICES	8 14
3	INDEFINITE INTEGRALS DEFINITE INTEGRALS	10 8
4	APPLICATIONS OF INTEGRATION - AREA & VOLUME DIFFERENTIAL EQUATIONS	6 10
5	TESTS, ASSIGNMENTS AND TUTORIALS (4 Periods per Unit)	10
TOTAL		**90**

SPECIFIC OUTCOME

MODULE - I VECTOR ALGEBRA AND BINOMIAL THEOREM.

1.1.0 Vector Algebra

1.1.1 Scalar and vector quantities.
1.1.2 Definition of a vector.
1.1.3 Representation of vectors.
1.1.4 Name a directed line segment as a vector.
1.1.5 Different types of vectors.
1.1.6 Addition and subtraction of vectors in terms of the segment.
1.1.7 Position vector of a point with reference to a point.
1.1.8 Difference of two vectors with same initial point as position vector of a point.
1.1.9 Orthogonal Cartesian axes ,the unit vectors i, j and k .
1.1.10 Types of vector product (a) scalar product (b) vector product
1.1.11 Scalar (dot) product and vector (cross) product.
1.1.12 Properties of dot product and cross product (no proof)
1.1.13 Simple problems to find
(i) Work done by a force (application of scalar product)
(ii) Moment of a force (application of vector product)

1.2.0 Binomial Theorem.

1.2.1 Concept of factorial
1.2.2 Meaning of nc_r and value of nc_r (No proof and no problems)
1.2.3 Use of nc_r in the expansion $(x + a)^n$, where n is positive integer.
1.2.4 State binomial theorem for a positive integer.
1.2.5 Expansion of $(x + a)^n$,and $(x - a)^n$ where n is positive integer. (Statement only).
1.2.6 General term of the expansion of $(x + a)^n$,and $(x - a)^n$
1.2.7 Properties of binomial expansion
1.2.8 Problems of the following types
1.2.8.1 Expand using Binomial theorem
1.2.8.2 Find a particular term in the expansion
1.2.8.3 Find middle term(s)
1.2.8.4 Find the coefficient of x^n
1.2.8.5 Find constant terms in $(x + a)^n$,and $(x - a)^n$

MODULE - II DETERMINANTS AND MATRICES.

2.1.0 DETERMINANTS.

2.1.1 Definition of determinant by means of algebraic expression
2.1.2 Order of a determinant
2.1.3 Evaluation of determinants of 2^{nd} & 3^{rd} order --- problems.
2.1.4 Solution of a system of simultaneous linear equations in two unknowns
2.1.5 Solution of a system of simultaneous linear equations in three unknowns

2.2.0 MATRICES.

2.2.1 Definition of matrices
2.2.2 Order of matrices
2.2.3 Different types of matrices
2.2.4 Algebra of matrices such as
Equality of matrices
Addition of matrices
Subtraction of matrices
Scalar multiplication and Multiplication
2.2.5 Problems on algebra of matrices
2.2.6 Transpose of a matrix
2.2.7 Symmetric and skew-symmetric matrices
2.2.8 Determinant associated with a square matrix
2.2.9 Singular and non singular matrices
2.2.10 Minors and cofactors
2.2.11 Cofactor matrix
2.2.12 Adjoint of a matrix
2.2.13 Inverse of a matrix

2.2.14 Solution of a system of three linear equations in two unknowns using the inverse of the coefficient matrix.

MODULE - III INTEGRAL CALCULUS.

3.1.0 INTEGRAL CALCULUS.

3.1.1 Integration as reverse process of differentiation

3.1.2 List standard integrals.

3.1.3 Rules of integration.

$$1.\int kf(x)dx = k\int f(x)dx. \qquad 2.\int \{f(x) \pm g(x)\}dx = \int f(x)dx \pm \int g(x)dx$$

3.1.4 Simple problems using standard results and rules of integration.

3.1.5 Simple problems using algebraic simplification and trigonometric results.

3.1.6 Integration by substitution method.

3.1.7 Solve simple problems on substitution method

3.1.8 Evaluation of integrals of the form

(1) $\int x^{n-1} f(x^n)\, dx$ 2) $\int \emptyset[f(x)]\, f(x)dx$

3) $\int f(x^n) f(x)\, dx$ 4) $\int \frac{f(x)}{f(x)} dx$ 5) $\int f(ax+b)dx$

3.1.9 Integration by parts.

3.1.10 Solutions of problems of the type x sinx, x^2 cos x, (ax + b) e^x, x $\sin^2 x$, log x, e^x sinx, x log x etc.,

3.2.0 DEFINITE INTEGRALS.

3.2.1 Meaning of $\int_a^b f(x)\, dx$ and definition of definite integral.(Correct notation)

3.2.2 Properties of definite integrals.

3.2.3 Problems of the same type as in indefinite integral using limits of integration.

MODULE – IV APPLICATIONS OF INTEGRATION

4.1.0 AREA AND VOLUME

4.1.1 Formulae for finding area bounded by a curve and volume of a solid of revolution (no proof)

4.1.2 Estimation of the area bounded by the curve y = f(x), the x- axis and the ordinates at x=a and x=b

4.1.3 Estimation of the area bounded by the curve y = f(x), and the x- axis

4.1.4 Estimation of the area enclosed between two curves $y_1 = f_1(x)$, and $y_2 = f_2(x)$

4.1.5 Simple problems to find the volume of solid of revolution.

4.2.0 DIFFERENTIAL EQUATIONS.

4.2.1 Definition of differential equation with examples
4.2.2 Order and Degree of D E with examples.
4.2.3 Solution of D E by variable separable method.
4.2.4 Problems on variable separable method.
4.2.5 Solution of a linear D E of the type $\frac{dy}{dx} + Py = Q$
4.2.6 Simple problems
4.2.7 Solution of D E of the type $\frac{d^2y}{dx^2} = f(x)$
4.2.8 Simple problems

CONTENT DETAILS

MODULE - I

1.1 Vector Algebra

Scalar and vector quantities, Definition of a vector, Representation of vectors, Name a directed line segment as a vector, Different types of vectors, Addition and subtraction of vectors in terms of the segment, Position vector of a point with reference to a point, Difference of two vectors with same initial point as position vector of a point, Orthogonal Cartesian axes ,the unit vectors i, j and k , Types of vector product (a) scalar product (b) vector product, Scalar (dot) product and vector (cross) product, Properties of dot product and cross product (no proof), Simple problems to find (i) work done by a force (application of scalar product) (ii) moment of a force (application of vector product).

1.2 Binomial Theorem

Concept of factorial , Meaning of nc r and value of ncr (No proof and no problems), Use of ncr in the expansion (x + a)n , where n is positive integer, State binomial theorem for a positive integer, Expansion of (x + a)n ,and (x - a)n where n is positive integer(statement only), General term of the expansion of (x + a)n ,and (x - a)n, Properties of binomial expansion, Problems of the following types (a) expand using Binomial theorem, (b) to find a particular term in the expansion, (c) to find middle term(s), (d) to find the coefficient of x^n , to find constant terms in (x + a)n ,and (x - a)n,

MODULE - II Determinants and Matrices

2.1 Determinants

Definition of determinant by means of algebraic expression , Order of a determinant, Evaluation of determinants of 2^{nd} & 3^{rd} order --- problems, Solution of a system of simultaneous linear equations in two unknowns, Solution of a system of simultaneous linear equations in three unknowns

2.2 Matrices

Definition of matrices, Order of matrices, Different types of matrices, Algebra of matrices such as Equality of matrices, Addition of matrices, Subtraction of matrices, Scalar multiplication and Multiplication, Problems on algebra of matrices, Transpose of a matrix, Symmetric and skew-symmetric matrices, Determinant associated with a square matrix, Singular and non singular matrices, Minors and cofactors, Cofactor matrix, Adjoint of a matrix, Inverse of a matrix, Solution of a system of three linear equations in two unknowns , Using the inverse of the coefficient matrix.

MODULE - III

3.1 Integral Calculus

Integration as reverse process of differentiation, List standard integrals, Rules of integration,

$1.\int kf(x)dx = k\int f(x)dx.$ $\quad 2.\int \{f(x) \pm g(x)\}dx = \int f(x)dx \pm \int g(x)dx$

Simple problems using standard results and rules of integration, Simple problems using algebraic simplification and trigonometric results, Integration by substitution method, Solve simple problems on substitution method, Evaluation of integrals of the form,

(1) $\int x^{n-1} f(x^n)\, dx$ $\quad$ 2) $\int \emptyset[f(x)]\, f'(x)dx$ $\quad$ 3) $\int f(x^n)f'(x)\, dx$ $\quad$ 4) $\int \frac{f'(x)}{f(x)}\, dx$

5) $\int f(ax + b)dx$

Integration by parts, Solutions of problems of the type x sinx, x^2 cos x, (ax + b) e^x, x $\sin^2 x$, log x, e^x sinx, x log x etc.

3.2 Definite Integrals

Meaning of $\int_a^b f(x)\, dx$ and definition of definite integral.(Correct notation), Properties of definite integrals, Problems of the same type as in indefinite integral using limits of integration.

MODULE - IV

4.1 Area and Volume

Formulae for finding area bounded by a curve and volume of a solid of revolution (no proof), estimation of the area bounded by the curve y = f(x), the x- axis and the ordinates at x=a and x=b, Estimation of the area bounded by the curve y = f(x), and the x- axis , Estimation of the area enclosed between two curves $y_1 = f_1(x)$, and $y_2=f_2(x)$, Simple problems to find the volume of solid of revolution.

4.2 Differential Equations

Definition of differential equation with examples, Order and Degree of D E with examples,

Solution of D E by variable separable method, Problems on variable separable method,

Solution of a linear D E of the type $\frac{dy}{dx} + Py = Q$, Simple problems, Solution of D E of the type $\frac{d^2y}{dx^2} = f(x)$, Simple problems

NB: Emphasis is mainly placed in application oriented problems and hence proofs and derivations are not expected.

TEXT BOOK:

Engineering Mathematics-II for polytechnic colleges by different authors.

REFERENCE BOOK:

1. W.R Neelakanta - Applied Mathematics – Sapna Publications.
2. Dr. D S Prakash - Applied Mathematics – S Chand Publications
3. Calculus : One-Variable calculus Vol-I, 2edn. - Apostol,WILEY

COURSE TITLE : ENGINEERING PHYSICS II
COURSE CODE : 2003
COURSE CATEGORY : F
PERIODS PER WEEK : 3
PERIODS /SEMESTER : 45
CREDITS : 3

TIME SCHEDULE

Module	Name of Module	Course Objective Number	Total periods per Semester		
			Instructional	Test	Total
I	Circular Motion and Rotational Dynamics.	1.1 - 1.4	12	1	13
II	Gravitation and Satellites.	2.1 - 2.6	8	1	9
III	Electromagnetism	3.1 - 3.3	12	1	13
IV	Modern Physics	4.1 - 4.9	9	1	10
	TOTAL		**41**	**4**	**45**

COURSE OUTCOME

After the completion of the course student will be able to:

- Create a clear cut understanding of various aspects of circular motion which is relevant to Engineering Science.
- Explain the Banking of roads and rails.
- Know the idea of a rigid body and its motion. It will impart the meaning of technical terms such as Moment of Inertia, Radius of gyration, axis of rotation, angular momentum and torque. He can also estimate various energies associated with rotation.
- Apply Equations of Translational and rotational motion in analysing rolling without slipping.
- Gather detailed ideas of Gravitational force and Acceleration due to gravity.
- Conceive introductory knowledge of different types of satellites.

- Derive technical terms such as Orbital velocity, Period, escape velocity of Satellites.
- Study orbital features of geostationary Satellites and its uses in everyday life.
- Study the orbital features of Polar Satellites and the uses of polar satellites.
- Get an overview of other types of satellites.
- Apply basic laws of Electricity and magnetism to solve simple problems concerning the motion and distribution of charges.
- Analyse complicated electrical circuits and find out currents through different branches and resistances in the circuit.
- Design simple electrical instruments using magnetic effect of electric current and understand how those devices can be used as multi range ammeters and voltmeters.
- Get basic ideas of the nature of light with special reference to quantum theory.
- Study quantitatively as well as qualitatively photoelectric effect.
- Derive Einstein's photoelectric electric equation.
- Get an overview of applications of photoelectric effect in various fields
- Understand the working of a Laser with special reference to Ruby laser, He-Ne gas laser and solid state laser with their merits and demerits.
- Introduction to various applications of Laser including communication.
- Create an awareness of nuclear fission and the working of nuclear reactors.
- Gather an introductory knowledge of nuclear fusion with special reference to energy production in stars.
- Impart an idea of alternative forms of energy sources.

SPECIFIC OUTCOME

MODULE - I 2.1 CIRCULAR MOTION AND ROTATIONAL DYNAMICS

2.1.1. Understand the concept of circular motion.
2.1.2. Define angular displacement and angular velocity.
2.1.3. Derive the relation between linear velocity and angular velocity.
2.1.4. Mention the expression for centripetal acceleration.
2.1.5. Apply the Principle of centripetal force in the case of banking of roads and rails.
2.1.6. Solve the problems related to centripetal force.
2.1.7. Understand the dynamics of rotating body.
2.1.8. Define the moment of inertia of a rigid body.
2.1.9. Define radius of gyration.
2.1.10. State theorems of parallel and perpendicular axes.
2.1.11. Define torque.
2.1.12. Mention the relation between torque and angular momentum.
2.1.13. Mention the expression for kinetic energy of rotation.

2.1.14. Derive the expression for moment of inertia of a uniform circular disc about an axis passing through its centre and perpendicular to its plane.

2.1.15. Derive expression for kinetic energy of a disc rotating on a horizontal plane.

2.1.16. Solve problems using above expressions.

MODULE – II 2.2 GRAVITATION AND SATELLITES

2.2.1. State Newton's law of gravitation.

2.2.2. Derive expression for orbital velocity, Period of satellite.

2.2.3. Define gravitational potential.

2.2.4. Mention expression for escape velocity.

2.2.5. Understand the idea of satellites.

2.2.6. Explain geostationary satellites and polar satellites.

2.2.7. Mention applications of geostationary and polar satellites.

MODULE - III 2.3 ELECTROMAGNETISM

2.3.1. Understand the terms electric charge and potential difference.

2.3.2. State Ohm's law

2.3.3. Explain the terms resistivity and conductivity.

2.3.4. Understand the law of resistances.

2.3.5. Understand the fundamentals of electricity and its magnetic effect .

2.3.6. State Kirchoff's laws.

2.3.7. Derive expression for balancing condition of wheatstone's Bridge.

2.3.8. State Biots and Savart's law.

2.3.9. Mention the expression for magnetic field due to current through a circular coil.

2.3.10. State Fleming's left hand rule.

2.3.11. Describe the principle and construction of a moving coil galvanometer.

2.3.12. Explain the conversion of galvanometer into ammeter and voltmeter

2.3.13. Solves problems based on the above laws.

MODULE - IV 2.4 MODERN PHYSICS

2.4.1. Understand laser action and its applications.
Explain population inversion, spontaneous emission, stimulated mission and optical pumping.

2.4.2. Write down the characteristics of Laser.

2.4.3. Describe various applications of Laser.

2.4.4. Explain the working of Ruby Laser, He –Ne laser.

2.4.5. Understand the advantage of gas laser over solid state laser.

2.4.6. Comprehend the theories of photoelectric effect

2.4.7. Describe Max plank's quantum theory.

2.4.8. Explain Photoelectric effect and application(photoelectric cell)

2.4.9. State Laws of Photoelectric emission.
2.4.10. Derive Einstein's photoelectric equation.
2.4.11. Solve problems using the above equation.
2.4.12. Understand nuclear fission and explain the working of nuclear reactors.
2.4.13. Understand nuclear fusion and explain the energy production in stars.

CONTENT DETAILS

MODULE – I CIRCULAR MOTION AND ROTATIONAL DYNAMICS (13Hrs)

Angular displacement – angular velocity – angular acceleration – relation between linear velocity and angular velocity in circular motion – centripetal acceleration – centripetal force – banking of roads and rails – problems.

Rigid body – centre of mass - moment of inertia – radius of gyration – statement of parallel and perpendicular axes theorems – derivation of moment of inertia of a disc about an axis passing through the centre and perpendicular to its plane – angular momentum and torque – relation between torque and angular momentum (only expression) – rotational kinetic energy – kinetic energy of a disc rolling on a horizontal surface – problems.

MODULE- II GRAVITATION AND SATELLITES (9Hrs)

Newton's law of gravitation- Expression for acceleration due to gravity- Factors affecting the value of g- variation of acceleration due to gravity- satellites- Artificial satellites- orbital velocity and period of a satellite-gravitational potential –escape velocity- geostationary satellites and it's uses- polar satellites and it's uses - uses of artificial satellites

MODULE - III ELECTROMAGNETISM (13Hrs)

Electric charge – potential difference – Ohm's law – verification of Ohm's law – resistivity – conductivity – law of resistances – Kirchhoff's laws – Wheatstone's Bridge – Metre Bridge- magnetic effect of electric current—Biot-savart law-magnetic field due to a current carrying conductor- force on a current carrying conductor placed in a magnetic field- Moving Coil Galvanometer and its working – shunt- conversion of a galvanometer into an ammeter - conversion of a galvanometer into a voltmeter – problems.

MODULE - IV MODERN PHYSICS (10Hrs)

Quantum theory – photoelectric effect – experiment to illustrate photoelectric effect – laws of photoelectric effect – Einstein's photoelectric equation – applications of photoelectric effect – problems.

Laser – principle of laser – characteristics – Ruby laser and its working–gas laser – Helium Neon gas laser and its working – advantages of gas laser over solid state laser – applications of laser.

Nuclear fission – chain reaction – nuclear reactor and its working – uses – nuclear fusion.- alternative forms of energy sources.

REFERENCE BOOKS

1. Resnick and Halliday - Physics
2. D.S.Mathur - Mechanics
3. Narayana Kurup - Mechanics
4. Murukesan - Modern Physics
5. A.Marikani - Engineering Physics
6. M N Avadhanulu - An Introduction to Lasers- Theory and Applications
7. H D Young - University Physics

COURSE TITLE : **ENGINEERING CHEMISTRY - II**
COURSE CODE : **2004**
COURSE CATEGORY : **F**
PERIODS PER WEEK : **3**
PERIODS /SEMESTER : **45**
CREDITS : **3**

TIME SCHEDULE

Module	Topic	Periods
1	Atomic Structure II and Chemical bonding	11
2	Electrochemistry and Corrosion	12
3	Basic Organic Chemistry and Polymers	9
4	Fuels and Environmental Chemistry	9
	Theory	41
	Test	4
Total		**45**

COURSE OUTCOME

Student will be able to

- Enable the students to understand the latest concepts of atom model.
- Develop the basic theoretical concepts of orbitals and facts related to it. Develop the skill of writing electronics configuration of atoms.
- Introduce the concept of Chemical bonding and distinguish different types of chemical bond.
- Distinguish and justify different materials based on conductivity in Science and Technology
- Illustrate the mechanism of electrolysis with examples and to solve the problems related to electrolysis. Apply the concept of fuel cell in modern technology.
- Summarise the concept of corrosion and its after effects, solve the practical Problems related to it.
- Distinguish different types of refractories and glasses and apply this in industrial field.
- Compare, differentiate, explain, relate and extend the concept of polymers and polymerisation with examples.
- Understand, list and differentiate the concept of fuels, Identify and relate the impact of environmental pollution in daily life and to point out the remedial steps for it.

SPECIFIC OUTCOME

MODULE - I:

1.1.0 ATOMIC STRUCTURE – II AND CHEMICAL BONDING

1.1.1 Explain Bohr model of atom with merits and demerits

1.1.2 Explain dual nature of atom, deBroglie relation and Uncertainity Principle

1.1.3 Introduce the concept of orbit, orbital and quantum numbers with shapes of s and p – orbitals

1.1.4 Explain Aufbau principle, Pauli's exclusion principle and Hund's rule of maximum multiplicity

1.1.5 Illustrate Electronic configuration of atoms of elements up to atomic number 20

1.1.6 Understand the idea of chemical bonding using octet rule

1.1.7 Explain different types of chemical bonds – Ionic bond, Covalent bond, Coordinate bond and Hydrogen bonding with examples.

MODULE - II

2.1.0 : ELECTROCHEMISTRY AND CORROSION

2.1.1. Distinguish between

a) Conductors and Insulators

b) Metallic and electrolytic Conductors

c) Strong and Weak Electrolytes

2.1.2 Illustrate electrolysis taking molten NaCl and aqueous NaCl solution as examples

2.1.3 Explain qualitative and quantitative statement of Faradays laws of electrolysis.

2.1.4 Explain the applications of electrolysis (electroplating and anodizing)

2.1.5 Outline schematic representation of galvanic cell

2.1.6 Explain the classification of galvanic cell as primary, secondary and fuel cells

2.1.7 Illustrate primary cell with Daniel Cell as example

2.1.8 Explain the concept of fuel cell taking H_2-O_2 fuel cell with advantages and applications

2.1.9 Introduce the concept of electrode potential and EMF of cell

2.1.10 Explain Electrochemical Series with applications

2.1.11 Define Corrosion

2.1.12 Explain rusting of Iron and mention the conditions of rusting

2.1.13 Explain electrochemical theory of corrosion

2.1.14 Describe the methods of prevention of corrosion (Barrier Protection, Sacrificial Protection, Cathodic Protection and Antirust Solutions.)

MODULE - III :

3.1.0 CHEMISTRY OF MATERIALS AND POLYMERS

3.1.1 Understand the fundamental ideas of Organic Chemistry
3.1.2 List the differences between Organic and Inorganic Compounds
3.1.3 Describe Uniqueness of Carbon atom
3.1.4 Distinguish between Saturated and Unsaturated Compounds and introduce Concept of functional group
3.1.5 Understand the retractories with the classification and properties
3.1.6 Explain general properties and types of glasses – soda glass, Borosilicate glass, safety glass and Insulating glass with their Contents and Uses
3.1.7 List the uses and advantages of optical fibres
3.1.8 Understand the term polymers, and polymerization
3.1.9 Explain the Various Classification of polymers
3.1.10 Distinguish between Natural and Synthetic rubber
3.1.11 Explain Vulcanisation and its merits
3.1..12 Introduce Common polymers- Poly ethene, polypropene, polystyrene, PVC, Neoprene, Teflon, Buna-s, Buna-N, Nylon-6 ,Nylon-66 and Bakelilte with their monomers and uses.

MODULE- IV

4.1.0**: FUELS AND ENVIRONMENTAL CHEMISTRY**

4.1.1 Understand the term fuel
4.1.2 Define Caloric Value
4.1.3 List the qualities of a good fuel
4.1.4 Explain the Classification into solid, liquid, gaseous and nuclearfuels with examples.
4.1.5 Explain preparation and properties of water gas and producer gas
4.1.6 Define cracking and distinguish between thermal and catalytic cracking
4.1.7 Introduce different regions of atmosphere
4.1.8 Recollect the terms Pollutant and Pollution
4.1.9 Understand different types of pollution – Air Pollution, Water Pollution and Soil Pollution
4.1.10 Understand the terms – ozone depletion, green house effect and acid rain
4.1.11 Explain different types of smog
4.1.12 Understand the relevance of Green Chemistry (Principle and scope in the present scenario)

CONTENT DETAILS

MODULE - I :

Atomic Structure II and Chemical Bonding (11+1=12 hours)

Bohr Model of atom – Postulates, Merits and Demerits - Dual nature of matter – de Broglie relation – Uncertainty Principle – Concept of Orbit and Orbital – Quantum numbers – Sub energy levels (s,p,d,f) - shape of s and p orbitals.

Electronic Configuration of atom – Aufbau principle, Pauli's exclusion principle, Hund's rule of maximum multiplicity – electronic configuration of elements upto atomic number 20.

Chemical bonding – Octet rule – Electro negativity- Types of Chemical bonds - lonic (Electrovalent) bond – Covalent bond, Coordinate bond and hydrogen bonding – Definition with two examples for each.

MODULE - II:

Electrochemistry and Corrosion (12+1=13 hours)

Classification of materials based on conduction – conductors, Semiconductors and Insulators – Definition with two examples each – Types of Conductors – Metallic and electrolytic conductors – Any four differences.

Electrolytes and Non - electrolytes – Definition with two examples – Strong and Weak Electrolytes – Definition with two examples -

Electrolysis – Definition – Electrolysis of molten NaCl and aqueous NaCl solution using Pt electrodes – Faraday's laws of electrolysis (Qualitative and Quantitative Statements only). Applications of electrolysis – Electroplating and Anodising – Any two differences – Electroplating of Nickel on mild steel – Anode, Cathode, electrolyte and half cell reactions – Electrochemical cell – Daniel cell – Representation of the cell – half cell and over all cell reactions – Primary and Secondary cells – definition and examples only – fuel cell – H_2-O_2 fuel cell – Cell reactions, advantages and applications – Electrode potential – standard electrode potential – EMF of cell – Electrochemical Series and its applications.

Corrosion – Definition and examples – rusting of iron Factors affecting rusting - conditions of rusting – Mechanism of rusting – Electrochemical theory – Types of Corrosion – Chemical and Electro chemical Corrosion – Prevention of Corrosion – Barrier Protection, Sacrificial Protection, Cathodic protection and Anti rust solutions.

MODULE - III:

Chemistry of Materials and Polymers (9+1=10 hours)

Introduction to organic chemistry – Differences between organic and inorganic compounds – Uniqueness of Carbon – Saturated and Unsaturated hydrocarbons –concept of functional group.

Refractories – Classification and properties – Glasses – General properties and types of glasses – Soda glass, Borosilicate glass, Safety glass and Insulating glass – Content and uses – Uses and advantages of Optical Fibres.

Polymers – definition – Classification of Polymers based on nature of monomers origin(source), structure, mode of synthesis and magnitude of intermolecular forces with two examples each – Natural rubber – Vulcanisation – Properties and merits – Common Polymers - monomers and uses – Polythene, Polypropene, Polystyrene, PVC, Neoprene, Teflon, Buna – S, Buna – N, Nylon-6, Nylon-66 and Bakelite.

MODULE - IV:

Fuels and Environmental Chemistry (9+1=10 hour)

Fuel - Definition – Calorific value – Qualities of a good fuel – classification of fuels – solid, Liquid, gaseous and nuclear fuels with three examples each – water gas and Producer gas – Preparation and Properties –Cracking – Thermal and Catalytic Cracking.

Environmental Chemistry - Regions of atmosphere – Pollutant and Pollution – Definition – Types of pollution – Air pollution, water pollution and Soil Pollution – Mention only major pollutants – Impact of Air Pollution – Ozone depletion, green house effect, acid rain and smog – Types of smog – Elementary ideas of green Chemistry.

REFERENCE :

Jain and Jain	Engineering Chemistry	Dhanpat Rai and Sons
S. S. Dara	Engineering Chemistry	S. Chand Publication
B. K Sharma	Industrial Chemistry	Geol Publication
S. S. Dara	Environmental Chemistry and Pollution Control	S. Chand Publication
	Wiley “All in One”	Wiley India Pvt. Ltd 2012 Editon.

COURSE TITLE : PROGRAMMING IN C
COURSE CODE : 2131
COURSE CATEGORY : Basic Engineering
PERIODS/WEEK : 4
PERIODS/SEMESTER : 60
CREDITS : 4

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Basic Programming Concepts in C	**15**
2	Functions and Pointers	**15**
3	One and Two-dimensional Arrays	**15**
4	Strings and Structures	**15**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	To comprehend the basic programming concepts in C
2	1	To understand the use of functions and Pointers
3	1	To know and apply One and Two-dimensional Arrays
4	1	To understand Strings
	2	To understand Structures

Specific Outcomes:

Module I - Basic Programming Concepts in C

1. To comprehend the basic programming concepts in C
    - 1.1 To know the C Character Set
    - 1.2 To describe the concept of Constants, Variable and Keywords
    - 1.3 To discuss C Instructions
    - 1.4 To know Control Instructions in C
    - 1.5 To know decision control structures
    - 1.6 To know logical operators
    - 1.7 To know conditional operators
    - 1.8 To know loop Control Structures
    - 1.9 To know Case Control Structure

Module II - Functions and Pointers

2. To understand the use of Functions and Pointers
    - 2.1 To know Functions
    - 2.2 To discuss passing values between Functions
    - 2.3 To know scope rule of Functions
    - 2.4 To know Function declaration and Prototypes
    - 2.5 To know Pointers
    - 2.6 To know Recursion
    - 2.7 To understand Data Types
    - 2.8 To list and use Storage Classes
    - 2.9 To know features of C Preprocessor
    - 2.10 To know Macros
    - 2.11 To know File Inclusion

Module III - One and Two dimensional Arrays

3. To know and apply One and Two-dimensional Arrays
    - 3.1 To know Arrays
    - 3.2 To understand passing Array elements to a Function
    - 3.3 To know Pointers and Arrays
    - 3.4 To discuss Two-Dimensional Array
    - 3.5 To know Pointers and Two – Dimensional Arrays
    - 3.6 To know Array of Pointers

Module IV - Strings and Structures

4.1 To understand Strings
- 4.1.1 To know about strings
- 4.1.2 To know about standard Library String Functions
- 4.1.3 To know about Two- Dimensional Array of Characters
- 4.1.4 To know array of Pointers to Strings

4.2 To understand Structures
- 4.2.1 To know about Structures
- 4.2.2 To discuss Array of Structures

CONTENT DETAILS

Module I- Basic Programming concepts in C

Basics of C – The C Character Set – Constants, Variables and Keywords – Types of C Constants – Types of C Variables – C Key Words – C Instructions -Type Declaration - Arithmetic Instruction- Integer and Float Conversion – Type Conversion in Assignment – Hierarchy of Operations - Associativity of operations – Control Instructions in C – The if Statement- Multiple statements within if- The if-else statement- Nested if-else- Use of logical operators- Hierarchy of logical operators- Conditional Operators – Loop Control structures – The while loop-The for loop- Nesting of Loops – Break Statement – The continue statement – The do-while loop – Case Control Structures – Decisions using Switch – The goto statement.

Module II- Functions and Pointers

Function –Usage of Functions – Passing values between Functions – Scope rule of Functions – Function declaration and prototypes – Call by value and Call by reference- Introduction to Pointers – Pointer Notation – Function Calls-Recursion – Recursion and Stack – Adding Functions to Library.

Data types – Integers, Long and Short, Signed and Unsigned – Characters, Signed and Unsigned- Float and Double – Storage classes in C – Automatic, Register, Static, External – Features of C Preprocessor – Macros with Arguments – Macros versus Functions- File inclusion

Module III – One and Two dimensional Arrays

Arrays – Array Initialization – Bounds Checking – Passing Array elements to a Function – Pointers and Arrays – Passing an entire Array to Function – Initializing a Two Dimensional Array – Memory map of Two Dimensional Array -Pointers and Two Dimensional Arrays –Pointer to an Array – Passing Two Dimensional Array to a Function - Array of Pointers

Module IV – Strings and Structures

Strings- Standard Library String Functions – strlen(),strcpy(),strcat(),strcmp() - Two-Dimensional Array of Characters- Array of pointers to Strings

Structures – Use of Structures – Declaring a structures – Accessing Structure elements- Array of Structures

Text Book(s):

1. Let Us C – Yashavant Kanetkar, BPB Publications, 13th Edition.

References:

1. Programming in ANSI C, E.Balagurusamy, TataMc-Graw Hill, 3rd Edition.
2. A Text Book on C ,E.Karthikeyan ,PHI Private Limited, 2008.
3. Programming in C D.Ravichandran, New Age International Publishers, 2011.
4. The C Programming Language, **Brian Kernighan and Dennis Ritchie, Prentice Hall , 2 Edition.**

Web Site :

http://freecomputerbooks.com/The-C-Programming-Language.html

COURSE TITLE : ENGINEERING GRAPHICS
COURSE CODE : 2005
COURSE CATEGORY : F
PERIODS/WEEK : 4
PERIODS/SEMESTER : 60
CREDITS : 5

TIME SCHEDULE

MODULE	TOPIC	PERIODS
1	Orthographic Projection	15
2	Sectional views and auxiliary views	15
3	Pictorial drawing	15
4	Visualisation and Development of surfaces	15
TOTAL		**60**

COURSE OUTCOME

After the completion of the course student will be able to

- Understand the orthographic projections of various objects
- Appreciate the sectional views of objects
- Appreciate the auxiliary views of objects
- Identify the pictorial drawings of various objects
- Understand the visualisation
- Understand the development of surfaces

SPECIFIC OUTCOME

MODULE - I

1.1.0 Understand the orthographic projections of various objects

1.1.1 Apply principles of orthographic projection
1.1.2 Explain the principle of orthographic projection with simple sketches
1.1.3 Prepare an engineering drawing of a given simple engineering part in first angle projection only.
1.1.4 Sketch (free hand) the orthographic views of simple objects
1.1.5 Draw the orthographic views of an object, given its pictorial drawing
1.1.6 Select the minimum number of views needed to represent a given object fully
1.1.7 Identify the engineering part correctly from a number of orthographic drawings

MODULE - II

2.1.0 Appreciate the sectional views of objects

- 2.1.1 Recognize the need of sectional views
- 2.1.2 Explain the need to draw sectional views
- 2.1.3 Select the section place for a given component to reveal maximum information
- 2.1.4 Free hand sectional views of simple objects
- 2.1.5 Draw the sectional views of simple engineering components
- 2.1.6 Sketch simple sections (Full and half) for a range of simple engineering objects
- 2.1.7 Select the component from a given sectional view
- 2.1.8 Auxiliary views

2.2.0 Recognize the need of auxiliary views

- 2.2.1 State whether the auxiliary view is needed, given an engineering drawing
- 2.2.2 Draw the auxiliary views of a given engineering drawing

MODULE - III

3.1.0 Identify the pictorial drawing of various objects

- 3.1.1 Prepare pictorial drawing
- 3.1.2 Explain the need for and types of commonly used pictorial drawing
- 3.1.3 Prepare isometric drawing of simple objects using appropriate construction procedure, given their appropriate drawing
- 3.1.4 Sketch the isometric views of simple engineering objects given either[1] orthographic drawing or actual components
- 3.1.5 Prepare oblique drawing –Cavalier and cabinet –of simple engineering objects given either orthographic drawing or actual drawing
- 3.1.6 Understand the visualisation
- 3.1.7 Visualise and object in 3D, given its orthographic drawing
- 3.1.8 Compare an engineering part with its drawing
- 3.1.9 Identify surfaces with reference to orthographic drawing wing
- 3.1.10 Prepare a model of the part, given its orthographic drawing

MODULE - IV

4.1.0 Understand the development of surfaces

- 4.1.1 Prepare development of surfaces
- 4.1.2 State the need for preparing the development drawing
- 4.1.3 Prepare development of surfaces of simple engineering components

like tray, funnel, bucket and ducts(rectangular and squarehooper)

4.1.4 Prepare development of surfaces of surfaces of 90^0 elbow

4.2.0 Computer Aided Drafting

4.2.1 Introduction to CAD

4.2.3 Compare conventional drawing and CAD

4.2.4 Familiarisation of different CAD software

4.2.5 Application of CAD in engineering drawing

4.2.6 Opening of CAD

4.2.7 Setting of units and limits

4.2.8 Saving of drawing

4.2.9 Commands-draw commands- line, circle, arc, ellipse, polygon (2D primitives) hatch, modify, erase, move, rotate, copy, mirror, break ,trim, extent, scale, stretch, array fillet, chamfer, offset etc.

4.2.10 Dimensioning and text commands

4.2.11 Practice- Different methods of drawing lines

4.2.12 Absolute coordinate system

4.2.13 Relative coordinate system

4.2.14 Polar coordinate system

4.2.15 Direct distance entry

4.2.16 Rectangle, circle, ellipse,

4.2.17 Practice to draw orthographic views of simple objects and

4.2.18 familiarise with the above commands

CONTENT DETAILS

MODULE - I

1.1.0 Orthographic projection of objects

Explanation of the meaning of orthographic projection using a viewing box and a model-number views obtained need of only three views for displaying the object.

Concept front view - top view and side view-sketching these views for a number of engineering objects- explanation of the meaning of first angle and third angle projection – symbol of projection

MODULE - II

2.1.0 Sectional views of objects

Need for sectional drawing of an engineering object- selection of the section plane to reveal the maximum information – sectional views (full and half section) of simple engineering objects.

2.1.1 Auxiliary views

Need of auxiliary views – auxiliary views given engineering drawings

MODULE - III

3.1.0 Pictorial Drawing

Isometric projections-construction of isometric scale-isometric projection of simple engineering object Oblique-cavalier-and cabinet projections of simple engineering Object

3.1.1 Visualization

Preparation of pictorial view from a group of orthographic Drawing

MODULE - IV

4.1.0 Development of surfaces

Development of surfaces of simple engineering components tray, funnel, bucket, duct (rectangular, square hooper) and 90^0 elbow

4.1.1 Computer Aided Drafting –

Introduction to CAD, Importance of CAD in engineering drawing- Applications

4.1.2 Opening CAD- setting and saving of drawing- CAD commands

4.1.3 Visualization Drawing with CAD- method of drawing straight line and simple figures.

TEXT BOOKS

1. Engineering Graphics - K. C Jon, PHI Learning Private Limited
2. Engineering Graphics - P. I. Varghese, VIP Publishers

REFERENCE BOOKS

1. Engineering Drawing - N D Bhatt
2. Engineering Graphics - Sageer & Abu

3 Engineering Drawing - M. B. Shah and B.C.Rana, Pearson Publications

4. Engineering Drawing & Graphics using Autocad – T.Jayapoovan,Vikas publications

COURSE TITLE : WORKSHOP PRACTICE
COURSE CODE : 2008
COURSE CATEGORY : F
PERIODS/ WEEK : 3
PERIODS/ SEMESTER (I & II): 90
CREDIT : 3

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Carpentry, Foundry & Casting	27
2	Smithy, Forging & Fitting	27
3	Sheet metal	18
4	welding	18
TOTAL		90

Course outcomes:

STUDENT WILL BE ABLE TO:

- Perform various exercises on given drawing and specifications in Carpentry shop, Foundry & Casting shop.
- Perform various exercises on given drawing and specifications in Smithy, Forging & Fitting shop.
- Perform various exercises on given drawing and specifications in Sheet metal shop.
- Perform various exercise on given drawing and specifications in Welding shop.

CONTENT DETAILS

MODULE I

Introduction, objectives, safety in the Carpentry shop, Foundry & Casting shop.
Familiarization of tools
Marking and measuring tools such as straight edge- meter square- try square- bevel square- combination square- marking knife- marking gauge- mortise gauge- cutting gauge- wing compares- trammel- divider- outside and inside calipers- spirit level and plumb bob.
Cutting tools such as Rip saw- Cross cut saw- panel saw- tenon saw- bow saw- compass saw- key hole saw- firmer chisel- bevel edge firmer chisel- parting chisel- mortise chisel- jack plane- wooden and metal- trying plane- smoothening plane- rebate plane- plough plane- router plate- spoke shave.
Boring tools such as Bradawl ratchet brace- wheel brace- shell bit- fostries bit- counter sunk bit.
Striking tools such as mallet etc
Holding devices – Bench vice- bench stop- sash clamp- G-clamp- hard screw.
Miscellaneous tools – Rasp cut file- scraper- glass paper- pincers- ratchet and cabinet type screw drivers.
Carpentry Practice

Marking- sawing- planning- chiseling- grooving- rebating exercises Preparation of carpentry joints.

Familiarization of Foundary tools

Hand tools – shovel- riddle- hammers- trowels- relic- lifters- strike off bar spruce- balloons- swab- gate cutter- mallet- vent rod- draw spike- lifting plate- pouring weight- gaggers- clamps, core & chaplets.

Moulding practice & casting

Preparation of moulding sand- Prepare moulds of different types using different patterns(single, double & three piece patterns)- ferrous & Non- ferrous metal casting using simple patterns.

MODULE II

Familiarization of Smithy tools

Hand tools – anvil- swage block- hammers such as ball peen- straight peen- cross peen and sledge hammers.Tongs such as flat- hallow- cold and hot chisels- swages- fullers- flatters- set hammers- pinch and drift.

Equipment: Open and closed hearth- heating furnaces- hand and power driven blowers- open and stock fire fuels such as charcoal- coal- oil and gas

Smithy & Forging Practice

Building fire in the furnace- Upsetting- bending- drawing- setting down- pinching- cutting and welding exercises

Familiarization of fitting tools

Hand tools & Marking tools – scriber- compass- dividers- outside and inside calliper- jenny calliper- ordinary scribing block- universal scribing block- angle plate- V-block- center punch- prick punch- try square- bevel square- surface plate- straight edge.

Cutting tools – chisels – flat- crosscut- half round- diamond point- side chisel. Files – single cut and double cut files rough- bastard- second cut- smooth Dead smooth files – flat- square- pillar- round triangular- half round- knife- safe edge and needle files.

Scribers – Neck saw – solid and adjustable frames – blades – cutting with point rack saw

Striking tools: Ball peen- straight peen- cross peen and double-faced hammers

Holding devices-vice-bench- leg- pipe- hand- pin and tool makers vice

Marking tools – scriber – ordinary and universal scribing block- center and prick punch.

Angle plate- v-block- Try Square- surface plate

Fitting Practice

Cutting - filing- scribing and simple joints exercises

MODULE III

Familiarization of Sheet metal tools

Understand safety precautions.

Familiarization of sheet metal tools – scribers- dividers- trammel points- set square- punches – prick Punches- centre punches – hand Grover- rivet- set- chisels hammers- riveting hammers- ball peen hammers – mallet- snip- shears- pliers- hand reamers (tongs) files- stakes. Measuring instruments in sheet metal folding rule- common rule- steel circumference rule- vernier calipers- micrometer- calipers- thickness gauges (SWG) sheet metal gauge.

Practice work

Sheet cutting- development- folding- bending and pipe bending- making right angle joints.

MODULE IV

Familiarization of welding tools & safety

Safety precautions- Study of various tools and equipments used in the welding shop for both arc welding and gas welding.

Practice work

1.D.C. arc welding

2.A.C. arc welding

3.Gas welding

4. Edge preparation of welded joint such as V and double V.

5.Horizontal -flat and vertical joints

General Information:

Examination in the Second Semester

TEXT BOOKS

1. **Mechanical Workshop Practice By K. C Jon, PHI Learning Private Limited**
2. **Mechanical Workshop & Laboratory Manual By K. C. John**

REFERENCE BOOKS

1. **S K Hajra Choudhary - Workshop Technology Vol. I**
2. **S K Hajra Choudhary - Workshop Technology Vol. II**

COURSE TITLE : ENGINEERING SCIENCE LAB (For Semester I & II)
[Engineering Physics & Engineering Chemistry Lab]
COURSE CODE : 2007
COURSE CATEGORY : F
PERIODS PER WEEK : 3
PERIODS /SEMESTER (I & II): 90
CREDITS : 3

ENGINEERING PHYSICS LAB

TIME SCHEDULE

SL.No	Name of module	Course objective	Total period in 1 and 2 semester		
			Instructional	Test	Total
1	Measurement and calculation of different physical quantities	1:1 1:2 1:3	Practical: 42	3	45
Total periods 1 and 2 semester 45					

On completion of the course the student will be able to:

1. To measure volume of a cylinder using vernier calipers.
2. To measure volume of a wire using screw gauge.
3. To determine focal length of a convex lens by displacement method.
4. To determine the velocity of sound in air at room temperature using resonance column.
5. To determine spring constant using Hooke's law..
6. To determine acceleration due to gravity using simple pendulum.
7. To verify law of resistances.
8. To determine specific resistance of material using Meter Bridge.
9. To determine Internal Resistance of a Primary Cell using Potentiometer.
10. To plot characteristics of photoelectric cell (photoelectric current vs intensity of light and voltage applied)
11. To determine the mass of the given body using moment bar.
12. To determine the mass of a body by parallelogram method and by Lami's theorem.
13. To verify Ohm's law and to determine the resistance of the given wire.

14. To determine the coefficient of viscosity of a highly viscous liquid.
15. To determine the relative density using U- tube apparatus.

LIST OF PRACTICAL EXPERIMENTS – PHYSICS

1. Vernier calipers
2. Screw gauge
3. Convex lens
4. Resonance column
5. Hooke's law
6. Simple pendulum
7. Law of resistances
8. Meter bridge
9. Potentiometer
10. Photoelectric cell
11. Moment bar
12. Concurrent forces(mass of the body)
13. Ohm's law
14. Stoke's method for viscosity
15. U tube

ENGINEERING CHEMISTRY LAB

SL.No	Name of module	Course objective	Total period in 1 and 2 semester		
			Instructional	Test	Total
1	Quantitative analysis(Volumetric analysis)	1:1 1:2 1:3	Theory: Practical: 39	- 6	45
Total periods 1 and 2 semester 45					

TIME SCHEDULE

On completion of the course the student will be able to:

Practical Volumetric Analysis

Single Titration

1. Standardisation of HCL
2. Standardisation of NaOH Double Titrations
3. Estimation of NaOH
4. Estimation of KOH
5. Estimation of Na2 CO3
6. Estimation of K2 CO3
7. Estimation of HCl
8. Estimation of HNO3
9. Estimation of H2 SO4
10. Estimation of Oxalic acid
11. Standardisation of KMnO4
12. Estimation of Oxalic acid
13. Estimation of Fe 2+ ion
14. Estimation of Mohr's Salt
15. Determination of PH of Solution
16. Estimation of Zinc using EDTA
17. Estimation of Magnesium Using EDTA

Reference:

Prof. A. O. THOMAS – PRACTICAL CHEMISTRY – Eight Edition 2000

COURSE TITLE	**:**	**PROGRAMMING IN C LAB**
COURSE CODE	**:**	**2139**
COURSE CATEGORY	**:**	**BASIC ENGINEERING**
PERIODS/WEEK	**:**	**3**
PERIODS/SEMESTER	**:**	**45**
CREDITS	**:**	**2**

Hardware Requirement : Desk Top Computer.

Software Requirement : : Linux Operating System with GCC

Course General Outcomes:

At the end of the Course, the students will be able to

- Develop the logic to solve the given problem.
- Understand the concepts of constants, variables, data types and operators.
- Develop programs using input and output operations.
- Write programs using decision control structures in C.
- Write programs using loop control structures in C.
- Write programs using case control structures in C.
- Write programs based on arrays.
- Write Programs using string handling functions.
- Write programs using user-defined functions,
- Write programs using structures
- Write programs using the concept of Pointers.

List of Experiments

1. **To apply programming concepts in C**
    a. Demonstrate output functions and input function for a simple application.
    b. Write programs for simple expression evaluation.

Create a Sample application for inputting details such as regno, branch code, semester and 5 marks of a student, calculate and display total mark along with student details.

    c. Write programs using simple if statement.
    d. Write programs using if..else, elseif and nested if.
    e. Write programs using switch statement.

*Sample Experiment :: Modify the sample application to calculate and display the **grade** based on the total mark along with student details*.

1. **To apply Looping controls and arrays**
    a. Write programs using while, do..while and for statements.

Sample Experiment :: Modify the sample application to calculate and display the details along with the total mark and grade of 'n' number of students.

b. Write programs using one dimensional array.

c. Write programs to perform one dimensional operations like

Insert, delete, search, sort, largest, smallest, second largest, and compute sum and

average of array elements

d. . Write programs using two dimensional arrays.

e. Write programs to perform two dimensional array operations like

Transpose of a matrix, checking of symmetric matrix, sum of elements of matrix, row sum,

column sum, sum of diagonal elements, matrix addition, matrix multiplication

Sample Experiment :: Modify the sample application to store the details of 'n' students into multiple arrays, calculate and display the total mark along with the student details in the order of total mark.

3. To apply Pointers and Strings

1.12 Write programs to apply pointers

1.13 Write programs for string manipulations

Sample Experiment :: Modify the sample application to store the details of 'n' students with following data elements regno, name (character array), branch, semester and 5 marks (integer array) and display student details along with total mark and grade based on boundary conditions.

4. To apply Functions

a. Write simple programs based on library functions

b. Write programs to illustrate 'User-defined functions"

c. Write Function subprograms using arrays and pointers

d. Write Function subprograms to illustrate array as argument

e. Write Function subprograms to Illustrate pointers as arguments

Sample Experiment :: Modify the sample application to store the details of n number of students in multiple arrays with following data elements – regno, name, branch, semester and 5 marks and display the student details along with total mark and grade based on boundary condition. Use function for grade calculation. Display the output with proper headings and format.

f. Write programs to illustrate structure

Sample Experiment :: Modify the sample application by creating a structure named student_details and display above mentioned students details.

TITLE : LIFE SKILL
COURSE CODE : 2009
COURSE CATEGORY : C
PERIODS/ WEEK : 2
PERIODS/ SEMESTER : 30
CREDIT : 2

COURSE OUTCOME:-

Providing direction for the next generation and equipping them for successful living.

Specific Outcome:

* To make students aware of their thinking styles and to enable them to convert thinking into performance
* To make students learn and practice the steps involved in time management
* To give training for positive thinking which will keep the students in a good stead at the time of crisis.
* To translate performance of skills into efficient habits
* To make students understand the concept and components of personality, thereby to apply the acquired knowledge to themselves and to march towards excellence in their respective academic careers.
* To bring out creativity and other latent talents with proper goal setting so that self-esteem gets enhanced.
* To train students in order to ground concepts/ideas in their own experience
* To give inputs on some of the important interpersonal skills such as group decision-making, negotiation and leadership skills.
  Introduce the basic concepts of body language for conflict management.
* To enable students to convert the conceptual understanding of communication into everyday practice.
* To help students understand the mechanism of stress particularly negative emotions such as anxiety, anger and depression for effective management.

TIME SCHEDULE

MODULE	TOPIC	PERIODS
I	Self Awareness and Empathy Logical Thinking and Creative Thinking	8
II	Decision Making And Problem Solving	6
III	Effective Communication	8
IV	Inter Personal Relations Coping with Stress and Emotion	8
TOTAL		**30**

MODULE - I - Self Awareness and Empathy

Logical Thinking and Creative Thinking

Self Concept – SWOT Analysis – Self Growth – Goal Setting – Time Management - Personal Well Being – Empathy – Understanding –Empathy Acknowledgement – Psychological Hug – Empathetic Language – Thinking – Process, types and components – Learning – creativity – Creative Problem Solving Right and left Brain thinking – Generative thinking techniques – Synthesis – Thinking outside the box – Lateral thinking – Risk taking

MODULE - II Decision Making and Problem Solving

Factors influencing Decision making – Values and Ethics – Emotional and physical considerations – Role conflict – Decision Making methods – Problem Solving – Process – Steps – Establishing frameworks, Analysing, evaluating options, and implementing solutions – Problem solving techniques

MODULE - III Effective Communication

Importance – Benefits – Levels/Dimensions - Barriers – Types – LRSW – Oral Communication – Non verbal communication, Body Language – Written Communication

MODULE - IV Interpersonal Relationship - Coping with Stress and Coping with Emotion

Nature - Factors influencing IPR – Trust – Strategies – Johari Window – Transactional Analysis – Team work – Assertive communication

Stress – Nature, types – Personality and stress – Managing stress – Relaxation techniques – Improving attitudes – Emotions - Emotional competence – Components – Promoting EI – Anger Management

Text Books:

1. Barun K Mitra (Oxford) - Personality Development and Soft Skills
2. Gopalaswamy Ramesh & Mahadevan Ramesh (Pearson) - The ACE of Soft Skills Attitude, Communication and Etiquette for Success

Diploma in Computer Engineering
Revision 2015
Syllabus
Semester - III

Semester III										
S. No	Code	Course	Course Category	Periods per week			Credits	Type	Evaluation	
				Theory	Practical	Total			CA	External
1	3133	Digital Computer Principles	B	4	0	4	4	T	50	100
2	3134	Objected Oriented Programming through C++	B	5	0	5	5	T	50	100
3	3131	Computer Architecture	B	4	0	4	4	T	50	100
4	3132	Database Management System	A	4	0	4	4	T	50	100
5	3001	Environmental Science & Disaster Management	C	3	0	3	3	T	50	100
6	3138	Digital Computer Principles Lab	B	0	5	5	3	P	50	50
7	3137	Objected Oriented Programming Lab	B	0	5	5	3	P	50	50
8	3139	Database Management System Lab	B	0	5	5	3	P	50	50
				20	15	35	29			

COURSE TITLE	**:**	**DIGITAL COMPUTER PRINCIPLES**
COURSE CODE	**:**	**3133**
COURSE CATEGORY	**:**	**B**
PERIODS/WEEK	**:**	**4**
PERIODS/SEMESTER	**:**	**60**
CREDITS	**:**	**4**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	**Digital Systems & Logic Gates**	**15**
2	**Combinational Logic**	**15**
3	**Sequential Logic**	**15**
4	**A/D, D/A, Memory and Programmable Logic**	**15**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	**1**	To understand Digital Systems and Data Representation
	2	To know Logic Gates and Boolean Algebra
2	**1**	To understand Gate Level Minimization
	2	To understand Combinational Logic
3	**1**	To understand Synchronous Sequential Logic
	2	To understand registers and Counters
4	1	To understand Analog to Digital and Digital to analog Convertor
	2	To understand Memory and Programmable Logic

Specific Outcomes:

MODULE –I Digital Systems & Logic Gates

1.1 To understand Digital Systems and Data Representation in Digital Computers

1.1.1 To state Digital Systems

1.1.2 To explain various Number Systems

1.1.3 To describe Binary Codes

1.2 To know Logic Gates and Boolean Algebra

1.2.1 To Describe Logic gates

1.2.2 To explain Boolean Algebra

1.2.3 To solve using Theorems and Properties of Boolean Algebra

MODULE – II Combinational Logic

2.1 To understand Gate Level Minimization

2.1.1 To Describe Map Method

2.1.2 To describe SOP and POS minimisation

2.1.3 To design and solve using Map method

2.2 To understand Combinational Logic

2.2.1 To explain different Combinational Circuits

MODULE – III Sequential Logic

3.1 To understand Synchronous Sequential Logic

3.1.1 To describe Sequential Circuits

3.1.2 To explain Storage elements – Latches & Flip-Flops

3.2 To understand registers and Counters

3.2.1 To explain different Registers

3.2.2 To explain Different counters

MODULE –IV A/D, D/A, Memory and Programmable Logic

4.1 To understand A/D and D/A converter

4.1.1 Discuss the different DAC specifications like resolution, accuracy, settling time monotonocity, line errors.

4.1.2 Study basic concept of DAC

4.1.3 Study basic concept of ADC.

4.2 To understand Memory and Programmable Logic

4.2.1 To describe Memory systems

4.2.2 To explain the decoding technique

4.2.3 To explain the different techniques in error detection and correction of data

4.2.4 To explain PAL and PLA

CONTENT DETAILS

MODULE –I Digital Systems & Logic Gat

Digital Systems – Binary numbers – Number base conversions- Octal, Hexadecimal - Complements of Numbers – Signed Binary Numbers - Binary Codes

Boolean Algebra – Introduction- Basic definitions – Axiomatic Definition of Boolean Algebra -Basic Theorems and Properties of Boolean Algebra – Boolean Functions- Canonical and standard forms –– Digital Logic Gates –

MODULE – II Combinational Logic

The Map Method – Four Variable K-Map – Product –of-Sums & Sum-of-Products Simplification – Don't Care Conditions – NAND and NOR Implementation – Two-level implementation –Exclusive –OR Function

Combinational Circuits – Binary Adder –Subtract or- Decimal Adder – Binary Multiplier – Magnitude Comparators-Decoder –Encoder-Multiplexer

MODULE – III Sequential Logic

Sequential Circuits – Storage elements – Latches & Flip-Flops

Registers – Shift register – Ripple Counters- Synchronous Counters-Ring counters - Johnson Counter

MODULE –IV A/D, D/A, Memory and Programmable Logic

DAC specifications like resolution, accuracy, settling time monotonocity, line errors. - DAC –-ADC

Random Access Memory -Memory decoding -Error detection and correction- Read Only Memory- Programmable Logic Array- Programmable Array Logic

Text Book(s):

1. Digital Design, M. Morris Mano & Michael D. Ciltti, Pearson Education, 5th Edition
2. Digital fundamentals – Thomas Floyd &R.P. Jain, Pearson Education (2005)

References:

1. Digital Principles and Applications – by Malvino & Leach , McGraw-Hill,
2. Fundamentals of digital circuits - A. Anand Kumar, PHI Learning Pvt. Ltd.,2003
3. Digital computer fundamentals - Thomas. C. Bartee, McGraw-Hill , 1985

COURSE TITLE	:	**OBJECT ORIENTED PROGRAMMING THROUGH C++**
COURSE CODE	:	3134
COURSE CATEGORY	:	B
PERIODS/WEEK	:	5
PERIODS/SEMESTER	:	75
CREDITS	:	5

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	**Basic Programming Concepts in C++**	21
2	**Concepts of Object Oriented Programming**	18
3	**Overloading of Operators and Inheritance**	18
4	**Advanced uses of C++**	18

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	To comprehend the basic programming concepts in C++
2	1	To understand the Concepts of Object Oriented Programming
3	1	To understand Overloading and Inheritance.
4	1	Advanced concepts of C++

Specific Outcomes:

MODULE I Basic Programming Concepts in C++

1.1 To comprehend the basic programming concepts in C++

1.1.1 Explain the features of C++
1.1.2 Explain data types and expressions in c++
1.1.3 Explain different control structures in c++
1.1.4 Explain Arrays as Homogeneous Aggregates
1.1.5 Explain Structures as Heterogeneous Aggregates
1.1.6 Describe the concepts Memory Management
1.1.7 Explain input and output with disk files.

MODULE II Concepts of Object Oriented Programming

2.1 To understand the Concepts of Object Oriented Programming
2.1.1 State the basic concepts of Object Oriented Programming
2.1.2 Describe parameter passing in C++ functions.
2.1.3 Explain the functions as modularization tool.
2.1.4 Describe Object-Oriented Programming with Functions
2.1.5 Describe Data Encapsulation and Information Hiding.
2.1.6 Explain classes, objects and methods
2.1.7 Illustrate constructors with examples
2.1.8 Describe the concepts of overloading

MODULE III Overloading of Operators and Inheritance

3.1 To understand Overloading and Inheritance.
3.1.1 Explain Overloading of Operators
3.1.2 Describe overloading for nonnumeric classes.
3.1.3 Describe different types of Inheritances.
3.1.4 Explain Visibility controls
3.1.5 Describe class objects as data members.
3.1.6 Explain base and derived class.
3.1.7 Explain Constructors and Destructors for Derived Classes
3.1.8 Discuss inheritance vs composition.

MODULE IVI Advanced concepts of C++

4.1 To understand Virtual functions and Templates
4.1.1 Explain Virtual functions
4.1.2 Explain conversion between nonrelated classes.
4.1.3 Explain the usage of several base classes.
4.1.4 Discuss subscript and function call operators.
4.1.5 Discuss input output operators.
4.1.6 Explain syntax of template class
4.1.7 Discuss Exception handling mechanism in C++
4.1.8 Describe type cast operators

CONTENT DETAILS

Module I: A Brief Overview of C++

The Basic Program Structure-Preprocessor Directives-Comments-Declarations and Definitions-Statements and Expressions-Functions and Function Calls-Classes-Data and Expressions-Values and Their Types-Integral Types-Floating Point Types-Control Flow-Statements and Expressions-Conditional Statements-Iteration-C++ Jump Statements-Defined Data Types-Arrays as Homogeneous Aggregates-Structures as Heterogeneous Aggregates-Unions, Enumerations, and Bit Fields-Memory Management: Storage Classes-Using Heap- Input and Output with Disk Files.

Module II: Object-oriented programming with C++

Programming With C++ Functions-C++ Functions as Modularization Tools-Argument Promotions and Conversions-Parameter Passing in C++-Inline Functions-Parameters with Default Values-Function Name Overloading-Object-Oriented Programming with Functions-Cohesion-Coupling-Data Encapsulation-Information Hiding.

C++ Class-Basic Class Syntax-Binding Together Data and Operations-Elimination of Name Conflicts-Implementing Member Functions Outside of Class-Defining Class Objects of Different Storage Classes-Controlling Access to Class Members-Initialization of Object Instances-Constructors as Member Functions-Default Constructors-Copy Constructors-Conversion Constructors-Destructors-Timing of Constructor and Destructor Invocations-Class Scope and the Overriding of Names in Nested Scopes-Memory Management with Operators and Function Calls-Using Returned Objects in Client Code-Static Class Members.

Module III Overloading of Operators and Inheritance.

Operator Functions: Overloading of Operators-Limitations on Operator Overloading-Overloaded Operators as Class Members-Friend Functions-Operator Overloading for Nonnumeric Classes-Overloading the Assignment Operator.

Aggregation and Inheritance: Using Class Objects as Data Members-Initialization of Composite Objects Data Members with Special Properties-Container Classes-Similar Classes: Inheritance-Accessing Base and Derived Class Services-Accessing Base Components of a Derived Class Object-Scope Rules and Name Resolution Under Inheritance-Constructors and Destructors for Derived Classes-Inheritance and Composition.

Module IV:Advanced uses of C++

Virtual Functions -Conversions Between Nonrelated Classes-Conversions Between Classes Related Through Inheritance-Multiple Inheritance: Several Base Classes-Unary Operators-Subscript and Function Call Operators-Input/Output Operators.

Templates: Syntax of Template Class Definition-Template Classes with Several Parameters-Relations Between Instantiations of Template Classes-Template Specializations-Template Functions-Programming with Exceptions--Syntax of C++ Exceptions-Exceptions with Class Objects-Type Cast Operators

Text Book(s)

1. Core C++ A Software Engineering Approach-Victor Shtern-Publisher: Prentice Hall PTR-First Edition July 24, 2000
2. The Complete Reference C++, Herbert Schildt, Tata McGraw Hill Publication, Fourth Edition**,**

References

1. E.Balaguruswamy, *Object Oriented Programming in C++,* Mc Graw Hill,Sixth Edition
2. Venugopal, Rajkumar, Ravishankar, *Mastering C++*, Mc Graw Hill,1999
3. Stroustrup, Bjarne, *The C++ Programming Language* , Addison Wesley, Fourth Edition
4. Robert Lafore, *Object Oriented Programming in C++*, Galgotia 1991

COURSE TITLE	**:**	**COMPUTER ARCHITECTURE**
COURSE CODE	**:**	**3131**
COURSE CATEGORY	**:**	**B**
PERIODS/WEEK	**:**	**4**
PERIODS/SEMESTER	**:**	**60**
CREDITS	**:**	**4**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Computer Function and Internal Memory	**15**
2	External Memory and Input/Ouptut	**15**
3	Processor Structure	**15**
4	Control Unit Organization	**15**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	**1**	To understand Von Neumann Machine
	2	To know Computer Memory Systemmplement Branch, Call and time delay
2	**1**	To understand External Memory
	2	To understand I/O Devices
3	**1**	To understand Processor Structure and Functions
4	1	To understand Control Unit Organization
	2	To know Parallel Processing

Specific Outcomes:

MODULE –I Computer Function and Internal Memory

1.1 To understand Von Neumann Machine

1.1.1 To describe Von Neumann Machine

1.1.2 To explain various Computer functions

1.1.3 To describe Interconnection structures

1.1.4 To describe Bus Interconnection

1.2 To know Computer Memory System

1.2.1 To list Cache Memory Principles

1.2.2 To explain Semiconductor Main Memory

1.2.3 To List Advanced DRAM types

MODULE – II External Memory and Input/Output

2.1 To understand External Memory

2.1.1 To Describe the organization of Magnetic Disk

2.1.2 To list and describe RAID

2.1.3 To explain Optical Memory

2.2 To understand I/O Devices

2.2.1 Toexplain different external Devises

2.2.2 To describe I/O Modules – Programmed IO, Interrupt Driven IO, DMA

MODULE – III Processor Structure

3.1 To understand Processor Structure and Functions

3.1.1 To describe Processor organization

3.1.2 To illustrate Register organization

3.1.3 To explain Instruction Cycle

3.1.3 To explain Instruction Pipelining

MODULE –IV Control Unit Organization

4.1 To understand Control Unit Organization

4.1.1 To describe Micro operations

4.1.2 To explain the control of the Processor

4.1.3 To explain the Hardwired implementation

4.1.4 To describe Micro programmed control

4.2 To know Parallel Processing

4.2.1 To explain Parallel processing

4.2.2 To describe Multiple processor organization

CONTENT DETAILS

MODULE –I Computer Function and Internal Memory

The Von Neumann Machine – Computer Components - Computer functions – Instruction Fetch and Execute – Interrupts – I/O Function- Interconnection structures - Bus Interconnection – Bus Structure –Multiple Bus Hierarchies –Elements of Bus Design

Characteristics of Memory System –The Memory Hierarchy - Cache Memory Principles - Elements of Cache Design -- Semiconductor Main Memory – Organization –DRAM and SRAM –Types of ROM - Advanced DRAM types- synchronous DRAM – Rambus DRAM – DDR SDRAM – Cache DRAM

MODULE – II External Memory and Input/Output

Magnetic Disk - Magnetic Read and Write Mechanism – Data Organization and formatting – Physical Characteristics – RAID – Level 0,1,2,3,4,5,6 - Optical Memory – Compact Disk – Digital Versatile Disk – High Definition Optical Disks

External Devices – Keyboard /Monitor – Disk Drive -- I/O Modules – Module function – I/O Module Structure - Programmed IO, Interrupt Driven IO, DMA

MODULE – III Processor Structure

Processor organization - Register organization – User visible Registers – Control and Status Registers - Instruction Cycle –The Indirect Cycle – Data Flow - Instruction Pipelining

MODULE –IV Control Unit Organization

Micro operations – Fetch Cycle – Indirect Cycle - Interrupt Cycle – Execute Cycle – Instruction Cycle - Control of the Processor - Hardwired implementation - Micro programmed control

Parallel processing - Multiple processor organization

Text Book(s)

1. Computer Organization and Architecture– William Stallings Pearson Education , Eighth Edition

References:

1. Computer Organization - Carl Hamachar- Mc Graw Hill, fifth edition.
2. Computer Architecture and Organization-John Hayes- Mc Graw Hill-1998.
3. Computer System Architecture -Morris Mano- Prentice Hallof India- 2002.,

Web Site

http://nptel.ac.in/course :s/Webcourse-contents/IIT-%20Guwahati/comp_org_arc/web/

COURSE TITLE	**:**	**DATA BASE MANAGEMENT SYSTEM**
COURSE CODE	**:**	**3132**
COURSE CATEGORY	**:**	**B/E**
PERIODS/WEEK	**:**	**4**
PERIODS/SEMESTER	**:**	**60**
CREDITS	**:**	**4**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Database Systems	**15**
2	Database Design	**15**
3	Structured Query Language	**15**
4	Normalisation and Transactions	**15**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	To Understand Database systems
2	1	To Understand Database Design
3	1	To Understand SQL
4	1	To Understand Emerging Technologies

Specific Outcomes:

MODULE – I Database systems

1.1 To Understand Database systems
- 1.1.1 Define data, information, field, record, file, and database
- 1.1.2 Define DBMS
- 1.1.3 Explain the advantages of DBMS
- 1.1.4 Describe the applications of DBMS
- 1.1.5 List the Database Users.
- 1.1.6 Define instance, schema and subschema
- 1.1.7 Explain Three Schema architecture with diagram
- 1.1.8 Explain Data Independence – Logical Data Independence and Physical Data Independence
- 1.1.9 Describe Conceptual Model, representation and physical model
- 1.1.10 Explain hierarchical, network and relational models
- 1.1.11 Describe DBMS Languages – DDL, DML and DCL
- 1.1.12 Explain Component Modules of DBMS
- 1.1.13 Centralised and Client-Server Database Systems

MODULE – II Database Design

2.1 To Understand Database Design
- 2.1.1 Explain Relational model concepts
- 2.1.2 Define Domains, Attributes, Tuples , Instances, relations and relational schema
- 2.1.3 Explain Keys – Super key, candidate key, composite key, primary key and foreign key
- 2.1.4 Explain E-R Model with example
- 2.1.5 Discuss the features of Enhanced E-R diagram
- 2.1.6 Explain Relational Algebra and fundamental operations
- 2.1.7 Explain Additional Operations - Natural-Join, Outer Join
- 2.1.8 Explain the mapping of E-R model to relational model

MODULE – III Structured Query Language

3.1 To Understand SQL
- 3.1.1 Explain features of SQL
- 3.1.2 Explain Data types in SQL
- 3.1.3 Explain CREATE TABLE command with constraints NULL, DEFAULT,CHECK, PRIMARY KEY, UNIQUE, referential Integrity
- 3.1.4 Explain INSERT, UPDATE and DELETE commands
- 3.1.5 Explain SELECT statements with WHERE, ORDER BY clause with examples
- 3.1.6 Describe the use of Aggregate and scalar functions in SELECT statements with examples
- 3.1.7 Explain SELECT statements with GROUP BY, HAVING clauses with examples
- 3.1.8 Explain Nested queries, sub queries
- 3.1.9 Describe DROP TABLE and ALTER TABLE command
- 3.1.10 Explain what are inner join and outer join
- 3.1.11 Explain how views are created and used
- 3.1.12 Explain transactions

3.1.13 Describe integrity constraints
3.1.14 Explain how index creation is done
3.1.15 Explain about authorizations on data and granting & revoking of privileges
3.1.16 Explain how to create and use functions, procedure, cursor and trigger
3.1.17 Explain Database connectivity using JDBC/ ODBC
3.1.18 Explain how to connect to a database

MODULE – IV Emerging Technologies

4.1 To Understand Normalisation
- 4.1.1 State functional dependency
- 4.1.2 Explain the need of normalisation
- 4.1.3 Describe decomposition of a table with examples

4.2 To Understand Emerging Technologies
- 4.2.1 Explain Object Oriented Concepts
- 4.2.2 Describe Object Identity, Object Structure
- 4.2.3 Explain Parallel DBMS.
- 4.2.4 Describe Distributed DBMS
- 4.2.5 Explain Mobile Databases
- 4.2.6 State Data Mining Technology
- 4.2.7 Describe Data Warehousing

CONTENT DETAILS

MODULE – I Database systems

Database Systems – Data – Information – Record – Field – Need of database system - Advantages and Disadvantages - application areas – people who interact with database - Three schema Architecture - Data independence - Data models – Database Schema versus database instance – Component modules of DBMS – Centralised and Client/Server Database Applications – Classification of DBMS.

MODULE – II Database Design

Relational Model Concepts – Domain – Attribute – tuple – instance – relation – relational schema – Keys – E R Model – Enhanced E R diagram – sub class – super class – inheritance – specialisation – generalisation – UML class diagram - Relational Algebra operations - select, project, Union, Set Difference, Cartesian Product and Rename – additional operations - Natural-Join, Outer Join - mapping of E-R model to relational model

MODULE – III Structured Query Language

SQL – Features of SQL – Data types in SQL - CREATE TABLE command, Constraints – NULL, DEFAULT,CHECK, PRIMARY KEY, UNIQUE, referential Integrity – INSERT, UPDATE and DELETE command - SELECT statements with WHERE, ORDER BY clause - Aggregate and scalar functions in SELECT statements - Nested queries, sub queries Statement - Views

Transaction commands – integrity constraints - CREATE INDEX, CREATE UNIQUE INDEX, DROP INDEX - authorizations on data and granting & revoking of privileges - functions, procedure - cursor and trigger - Database connectivity using JDBC/ ODBC

MODULE – IV Emerging Technologies

Normalisation -Functional Dependency - Decomposition –– Introduction to Object oriented databases-Features-Object identity- Object Structure. Parallel DBMS - Overview - Architecture - Distributed DBMS - Advantages Mobile Databases - Concept .Databases and Internet.Introduction to Data Mining and Data warehousing.

Text Book(s)

1. Database Systems – Elmasri, Navathe (Pearson) Sixth Edition

REFERENCE

1. Introduction to Database Systems – ITL Education Solutions Ltd – PEARSON- 2010
2. Database system concepts - Silberschatz, Korth, and Sudarshan (TMH)-Sixth Edition
3. SQL for professional - Swapne & Rajesh Naik

COURSE TITLE : ENVIRONMENTAL SCIENCE AND DISASTER MANAGEMENT
COURSE CODE : 3001
COURSE CATEGORY : P
PERIODS/ WEEK : 3
PERIODS/ SEMESTER : 45
CREDIT : 3

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Renewable and Non-renewable Resources	12
2	Ecosystems	11
3	Environmental Pollution and its control	11
4	Hazards, Disasters and Mitigation measures	11
TOTAL		**45**

GENERAL COURSE OUTCOME

Sl.	Sub	Student will be able to
1	1	Understand the various types of natural resources and problems due to over exploitation.
	2	The components of various types of ecosystem and interrelation between the components.
	3	Understand various factors which cause environmental pollution and their control measures.
2	1	Understand various hazards & disasters, their affects and mitigation measures.

SPECIFIC COURSE OUTCOME:

MODULE - 1: RENEWABLE AND NON-RENEWABLE RESOURCES

1.1.0 Understand the various types of natural resources and problems due to over exploitation.
1.1.1 List various resources supplied by forest.
1.1.2 Explain various uses of forest resources.
1.1.3 Identify the problems due to over exploitation of forests.
1.1.4 Explain the problems due to de-forestation.
1.1.5 Identify the social and ecological problems due to dams.

1.1.6 Identify various sources of fresh water.
1.1.7 State the importance of water as a resource.
1.1.8 Explain the problems due to over consumption of water.
1.1.9 Identify the causes of flood and drought.
1.1.10 Explain the reasons for the conflicts over water.
1.1.11 Describe the advantages and disadvantages due to large dams.
1.1.12 List various mineral resources.
1.1.13 State the problems due to mining.
1.1.14 Explain the environmental impacts due to mining.
1.1.15 State the reasons for global food crisis.
1.1.16 Explain impacts on food production due to adoption of modern agricultural practices.
1.1.17 Explain the problems due to the use of artificial pesticides and fertilizers.
1.1.18 Identify the causes for water logging, salinity and Eutrophication and the problems due to that.
1.1.19 Explain the world energy scenario and energy demands
1.1.20 List various conventional and non-conventional sources of energy.
1.1.21 Distinguish between renewable and non renewable sources of energy.
1.1.22 State the importance of renewable energy.
1.1.23 Explain the importance of energy conservation.
1.1.24 Define sustainable development and state its importance.
1.1.25 Explain why land is considered as a resource.
1.1.26 List the different types of resources from land.
1.1.27 Identify the causes for land degradation.
1.1.28 State the reasons for soil erosion, land slide and desertification.
1.1.29 Describe the control measures for land degradation.
1.1.30 Describe the role of an individual in conservation of resources and achieving sustainable development

MODULE – 2: ECOSYSTEMS

2.1.0 Understand the components of various types of ecosystem and interrelation between the components.

2.1.1 Define an Ecosystem.
2.1.2 Explain the biotic and abiotic components of an ecosystem.
2.1.3 Identify the producers, consumers and decomposers in an ecosystem.
2.1.4 Explain the role of producers, consumers and decomposers in an ecosystem.
2.1.5 State the meaning of what is meant by Biomes.
2.1.6 Explain the phenomenon Ecological Succession.
2.1.7 Explain food chain and food web.
2.1.8 State the inter dependence of each link in a food chain.
2.1.9 Explain the ecological pyramid.
2.1.10 Explain Biomagnifications and its impacts.
2.1.11 Explain the types, structure and characteristic features of forest ecosystem
2.1.12 Explain the types, structure and characteristic features of grassland ecosystem
2.1.13 Explain the types, structure and characteristic features of desert ecosystem
2.1.13 Explain the types, structure and characteristic features of aquatic ecosystem
2.1.14 Describe the importance of biodiversity and the need to conserve it.
2.1.15 Illustrate the effects of urbanization – Heat islands, stress on land and water
2.1.16 Identify the causes of global warming and the effects due to that.

MODULE – 3: ENVIRONMENTAL POLLUTION AND ITS CONTROL

3.1.0 Understand various factors which cause environmental pollution and their control measures.

3.1.1 Define environmental pollution.
3.1.2 Identify the factors contributing air pollution.
3.1.3 State the role of air pollution in global pollution.
3.1.4 Explain the effectsof air pollution.
5.1.5 State various methods to control air pollution.
5.1.6 Explain the functioning of air pollution control devices.
3.1.7 Identify the sources contributing to water pollution.
3.1.8 State the role of water pollution in global pollution.
3.1.9 Explain theeffectsof water pollution.
5.1.10 State various methods to control water pollution.
5.1.11 Explain the functioning of water pollution control devices.
3.1.12 Identify the sources contributing oil pollution.
3.1.13 State the role of oil pollution in marine pollution.
3.1.14 Explain the effectsof oil pollution.
5.1.15 State various methods to control oil pollution.
3.1.16 Identify the factors contributing marine pollution.
3.1.17 State the role of marine pollution in global pollution.
3.1.18 Explain the effectsof marine pollution.
5.1.19 State various measures to control marine pollution.
3.1.20 Identify the factors contributing noise pollution.
3.1.21 State the role of noise pollution in environmental stress.
3.1.22 Explain the effectsof noise pollution.
5.1.23 State various measures to control noise pollution.
3.1.24 Identify the factors contributing thermal pollution.
3.1.25 State the role of thermal pollution in global warming.
3.1.26 Explain the effectsof thermal pollution.
5.1.27 State various measures to control thermal pollution.
3.1.28 Identify the major nuclear hazards occurred in the world.
3.1.29 State the global affects of nuclear radiation.
3.1.30 Explain the local affects of nuclear pollution.
3.1.31 Identify various categories of solid wastes.
3.1.32 Explain various methods of solid waste management specific to each category of waste.
3.1.33 Explain the effectsdue to solid waste pollution.
3.1.34 Explain EIA and the need for EIA while implementing projects.
3.1.35 Identify the factors to be considered for conducting EIA of a mini-project.
3.1.36 Explain the role ofeach individual to control various aspects of environmental pollution.
3.1.37 Explain the case studies of cause and effect of each category of pollution.

MODULE – 4:HAZARDS, DISASTERS AND MITIGATION MEASURES

4.1.0 Understand various hazards & disasters, their affects and mitigation measures.

4.1.1 Define Hazard, Disaster, Vulnerability, Risk and Capacity.
4.1.2 Explain the relation between Hazard, Disaster, Vulnerability, Risk and Capacity.
4.1.3 State the factors influencing vulnerability and risk.
4.1.4 Explain assessment, evaluation and management of risk.

4.1.5 Identify the classifications of hazards based on various aspects.
4.1.6 Explain the causes for different types of disasters.
4.1.7 List the effectsof each type of disaster on human beings and ecosystem.
4.1.8 Illustrate major hazards under each category occurred in world as case study.
4.1.9 Explain the disaster management operation cycle.
4.1.10 Identify and explain various operations to be carried out during pre-disaster phase.
4.1.11 Identify and explain various operations to be carried out during emergency phase.
4.1.12 Identify and explain various operations to be carried out during post-disaster phase.
4.1.13 Explain the relationship between disaster and development.
4.1.14 Illustrate how health and disaster management are interrelated.
4.1.15 Explain the Institutional frame work of disaster management in India at National, state and district level and the role of each body.
4.1.16 Explain hazard zonation map.
4.1.17 Explain new & emerging approach in disaster management – Use of Early warning systems base on IT enabled services like GIS, GPS, MIS, DDS, Remote sensing etc.
4.1.18 Illustrate the community based disaster preparedness programmes as a mitigation measure.
4.1.19 Explain various preventive measures for disaster risk reduction.
4.1.20 Explain the need for safety audit - onsite and offsite safety audits to be done and formulation of emergency plans.
4.1.21 Explain the management plan for transportation accidents.
4.1.22 State the use of TREM card in accidents involving hazardous goods transport.
4.1.23 State the role of regulatory frame work and code of practice in disaster management.
4.1.24 Explain the role played by various acts related to disaster management.

CONTENT DETAILS

MODULE - 1: RENEWABLE AND NON-RENEWABLE RESOURCES

Natural resources and associated problems:

(a) Forest resources: Use and overexploitation, deforestation, case studies, mining, dams and their effects on Forests, Environment and tribal people.
(b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
(c) Mineral resources: Use and exploitation, environmental effects of Mining and extraction of mineral resources, case studies.
(d) Food resources: World Food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, Genetically modified crops – boon or bane, fertilizer-pesticide problems, water logging, salinity, Eutrophication, Case studies.
(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Importance of energy conservation and sustainable development.
(f) Land resources: Land as a resource, land degradation, role of land use planning in sustainable development, human induced landslides, soil erosion and desertification.
(g) Role of individuals in the conservation of natural resources. Equitable use of resources for sustainable development.

(Students shall conduct a case study of any resource utilization as an assignment)

MODULE - 2: ECOSYSTEMS

Concept of an ecosystem, structure and functions of biotic and abiotic components of an ecosystem, producers, consumers and decomposers. Biomes, Ecological succession.
Food chains, food webs and ecological pyramids, Biomagnifications.
Introduction, types, characteristics features, structure and function of the following ecosystem:

(a) Forest ecosystem
(b) Grassland ecosystem
(c) Desert ecosystem
(d) Aquatic ecosystems (Ponds, streams, lakes, ox-bow lakes, rivers, estuaries, oceans)
(e) Concept of biodiversity - Importance of biodiversity conservation
(f) Urbanization and impacts on environment (Heat island, stress on water and soil), global warming, climate change, sea level rise.

(Students shall study the characteristic features of any local ecosystem as an assignment)

MODULE - 3: ENVIRONMENTAL POLLUTION AND ITS CONTROL

Definition of Environment and Environmental Pollution. Causes, effects and control measures of (a) Air pollution (b) Water pollution (c) Oil pollution (d) Marine pollution e) Noise pollution (f) Thermal pollution g) Nuclear hazards. Case studies in each type of pollution. Environmental stress.
Solid waste management: Causes, effects and control measures of urban and industrial wastes.
Introduction to Environment Impact Analysis. Role of an individual in prevention of pollution.
(Students should conduct the case study of any local pollution issue and suggest remedial measure as an assignment)

MODULE - 4: HAZARDS, DISASTERS AND MITIGATION MEASURES

Define: Hazard, Disaster, Vulnerability (Physical, Economic and Social vulnerability), Risk, Capacity and inter-relationship between them. Factors influencing vulnerability and risk. Risk management, assessment and evaluation.
Classification of disasters, causes and consequences – Natural disasters (cyclone, earth quake, tsunami, flood, drought, land slide, lightning, forest fire, volcanic eruption) and Human-induced disasters (Air, road & rail accidents, boat capsize, oil spill, building collapse, fire, industrial hazards, chemical hazards, explosion, war). Classification of disasters based on the origin (Water & climate based, geological origin, Chemical/industrial/nuclear disasters- Hazchem& MAH(Major Accident hazard) units, biologically related disasters, human induced disasters/accidents) - Case studies of each type of disaster.
Disaster management cycle - Operations in each phase – Pre-disaster phase (Planning, Preparedness, Prevention & Mitigation), Structural and Non-structural mitigation measures (Structural eg. Dams, embankment, stone walls, Installing early warning systems, disaster resistant constructions and non-structural - eg. Insurance, IEC-information-education-communication, land use zoning, preparedness plan, mock drills, costal shelter plantation) – Emergency phase (communication, evacuation, rescue search & relief operation, medical assistance) – Post disaster phase (Reconstruction and rehabilitation, economic & environmental aspects, Administrative & political aspects) - Relationship between disaster and development – Health and disaster management plan, holistic approach.
Disaster profile of India - Institutional frame work of disaster management in India (National, state and district level) – Hazard zonation map - New & emerging approaches in disaster management – Use of

information technology (GIS, GPS etc) in disaster management - Community based disaster preparedness - Disaster risk reduction - Safety audits, onsite and offsite emergency plans – Management of transportation accidents, use of TREM card.
Regulatory frame work and code of practice (Petroleum act-1934, Factories act-1948, Insecticide act-1968, Explosives act-1984, Environmental protection act-1986, Coastal regulation zone (CRZ) Act-1991, Disaster management Act-2005).

REFERENCE BOOKS

1.Environmental studies–From Crisis to Cure,R. Rajagopalan,Oxford UniversityPress, 2005
2.Environmental Science & Engineering, P. Anandan, R. Kumaravelan, Scitech.
3.Environmental Studies for Undergraduate courses, ErachBharucha, UniversitiesPress.
4.R.B.Singh (Ed). Disaster Management, Rawat Publication, New Delhi, 2000
5.H.K.Gupta (Ed). Disaster Management, Universities Press India, 2003

COURSE TITLE	**:**	**DIGITAL COMPUTER PRINCIPLES LAB**
COURSE CODE	**:**	**3138**
COURSE CATEGORY	**:**	**B**
PERIODS/WEEK	**:**	**5**
PERIODS/SEMESTER	**:**	**75**
CREDITS	**:**	**3**

Course General Outcomes:

The student should be able to do the experiments from the following topics on completion of corresponding topic

1.0 To implement basic logic gates

1.0.1 Implement logic gates using basic components

1.0.2 Verify the Logic behaviour of various IC gates: 7408, 7432, 7404, 7400, 7402, 7486)

1.0.3 Implement basic gates using Universal Gates (NAND & NOR)

1.0.4 Simplification of Boolean Functions SOP & POS forms (Demonstrates the relationship between a Boolean Function and the corresponding logic diagram – using Map reduction method)

Eg: Plot the following Boolean function in a Map as well as implement in a logic diagram

F= A'D + BD +B'C + AB'D

2.0 To design and Implement Combinational Circuits

2.0.1 Implement the following Combinational Circuits (Design, construct, and test combinational logic circuit that generates parity bit from four message bits)

2.0.2 Design a combinational circuit that converts a Gray code to binary, Decoder for a binary digit to BCD, and a seven segment indicator

2.0.3 Design, construct, and test a half-adder & a full-adder Implement using Basic gates and Universal gates

2.0.4 Implement a circuit using a four-bit binary parallel adder (IC 7483) implement Adder-Subtractor, and a Magnitude Comparator)

3.0 To demonstrate synchronous sequential logic

3.0.1 Construct, Test, and investigate the operation of SR Latch, D Latch, Master-Slave Flip-Flop, Edge-Triggered Flip-Flop, IC Flip-Flops(using IC 7476, and 7474)

3.0.2 Sequential Circuits (Design, construct, and test Up-Down counter with Enable)

3.0.3 Design, construct, and test a counter that goes through a sequence of binary states (User controlled counting pattern)

3.0.4 Construct, and test Ripple Counter, Synchronous counter, Decimal Counter

3.0.5 Setup a Binary counter with Parallel Load (use IC 74161))

3.0.6 Study the operation of Shift Registers (Investigate the operation of Shift Registers, Ring Counter, Feedback Shift Register, Bidirectional Shift register, Bidirectional Shift Register with Parallel Load)

COURSE TITLE	**:**	**OBJECT ORIENTED PROGRAMMING LAB**
COURSE CODE	**:**	**3137**
COURSE CATEGORY	**:**	**B**
PERIODS/WEEK	**:**	**5**
PERIODS/SEMESTER	**:**	**75**
CREDITS	**:**	**3**

Hardware Requirement: Desk Top Computer

Software Requirement : Linux Operating System with gcc and g++

LIST OF EXPERIMENTS

1. Simple C++ Programs to Implement Various Control Structures.
    a. If statement
    b. Switch case statement and do while loop
    c. For loop
    d. While loop
2. Programs to Understand Structure & Unions.
    a. Structure
    b. union
3. Programs to Understand Pointer Arithmetic.
4. Functions & Recursion.
    a. Recursion
    b. function
5. Inline Functions.
6. Programs to Understand Different Function Call Mechanism.
    a. Call by reference & Call by Value
7. Programs to Understand Storage Specifiers.
8. Constructors & Destructors.
9. Use of “this” Pointer. Using class
10. Programs to Implement Inheritance and Function Overriding.
    a. Multiple inheritance –Access Specifiers
    b. Hierarchical inheritance – Function Overriding /Virtual Function
11. Programs to Overload Unary & Binary Operators as Member Function & Non Member Function.
    a. Unary operator as member function
    b. Binary operator as non member function
12. Programs to Understand Friend Function & Friend Class.
    a. Friend Function
    b. Friend class
13. Programs on Class Templates

COURSE TITLE : DATA BASE MANAGEMENT SYSTEM LAB

COURSE CODE : 3139

COURSE CATEGORY : B

PERIODS/WEEK : 4

PERIODS/SEMESTER : 60

CREDITS : 2

Software Requirement: MySql

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	Practice different DDL,DML and DCL commands
	2	Practice queries
2	1	Define views
	2	Create cursors and triggers
3	1	Apply connections from programming languages like JAVA and PHP
	2	Implement various embedded languages
4	1	To Understand Normalisation and Transactions

Specific Outcomes:

1.1 Create one or two tables. Bring in all possible constraints like NOT NULL,

DEFAULT, CHECK, PRIMARY KEY, UNIQUE etc.

1.2 Enter considerable number of tuples of all sorts to the tables.

1.3 Write various SELECT clauses to generate different types of listing of data.

(Use WHERE, HAVING, DISTINCT, GROUP BY and ORDER BY clauses and subqueries)

Core Problem (Phase 1): Analyse a real problem situation/application and represent it using an ER-Diagram. Create tables as per ER Diagram and insert relevant data.

2.1 Create various views of the table.

2.2 Delete unwanted tuples from tables.

2.3 Modify the schema of one or more tables to incorporate a change.

2.4 Develop queries for inner and outer joins.

3.1 Create cursors and triggers for manipulating tables.

3.2 Write functions and/or procedure for various simple tasks.

3.3 Develop a simple application in Java/PHP to make a connection to the

database and access the data.

Core Problem (Phase 2):

Check whether the tables created are normalized.

Develop functions/stored procedure for identified tasks.

Develop the miniature form of application that connects to the database using JDBC/ODBC.

4.1 Design and develop a form to enter data into tables using JAVA/PHP.

4.2 Develop a Java/PHP program to access the table and generate a report.

Core Problem (Phase 3):

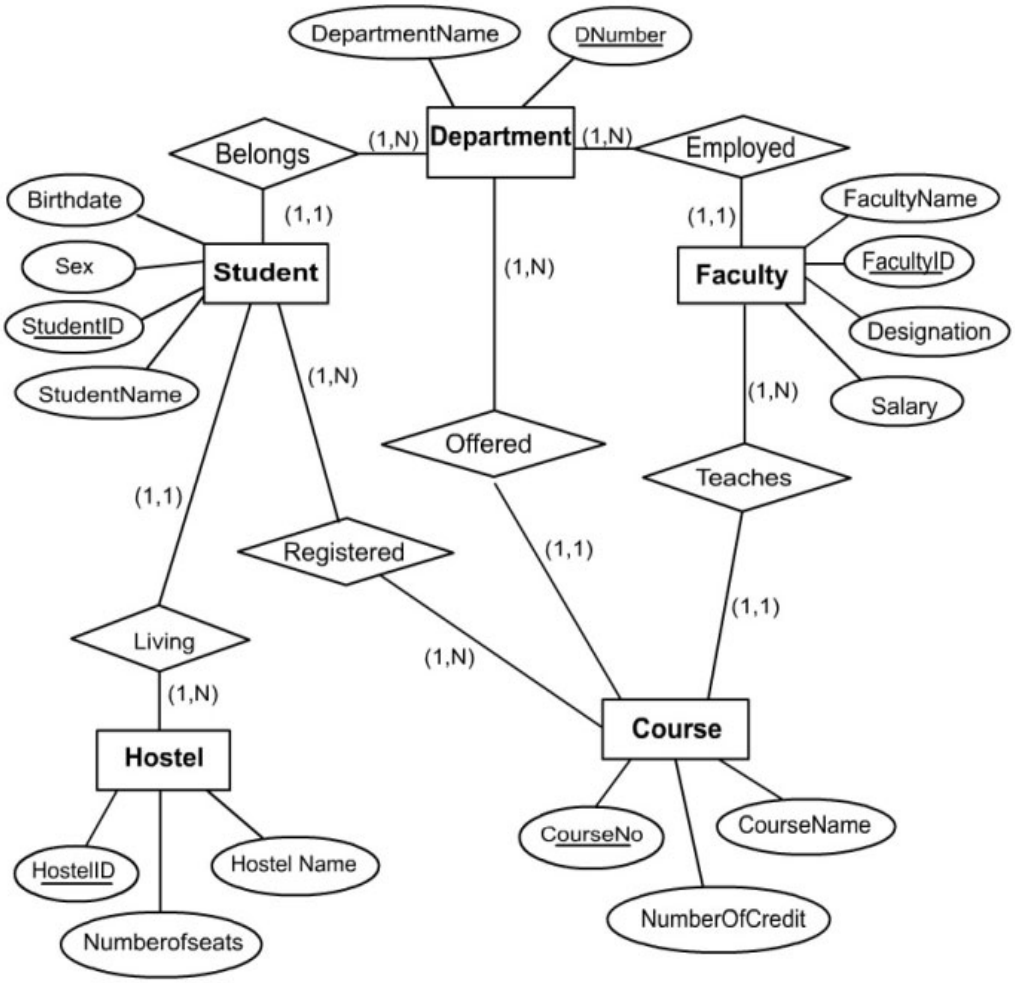
Design and develop table data entry form(s).

Develop the final application from the miniature form.

Sample Core Problem: The diagram shown below represents the academic functioning of a college. There are five entities viz. Department, Faculty, Student, Course, and Hostel. All the five entities have their own attributes.DNumber, FacultyID, StudentID, CourseID, and HostelID are the key attributes of Department, Faculty, Student, Course and Hostel respectively. The entities are related to each other and the respective relationships are explained below:

A college has many departments. A department would have students as well as faculty. The one to many relationship between department and students, and, department and faculty states that a department belongs to many students and it employs many faculty members. Looking at these relationships in a reverse direction conveys that a student as well as a faculty belongs to a single department and thus establishes one to one relationship.

A student can register himself into various courses; similarly a course can be studied by many students. A student lives in a single hostel but a hostel accommodates many students. A department offers many courses but a particular course belongs to a particular department. A faculty teaches many courses but a particular course is taught by a single faculty only.



Phase 1:

Create five tables: 1) Department, 2) Faculty, 3) Student, 4) Course and 5) Hostel. Include the necessary constraints.

Insert at least 10 tuples to each table.

Generate the following results:

i) **List out the ID, Name and Date of Birth of students in the ascending order of Date of Birth**
ii) **List out the ID, Name and Date of Birth of students registered for a specific course.**
iii) **List out the ID, Name and Date of Birth of students registered for a specific course, staying in a specific Hostel.**
iv) **Prepare department wise student list with ID, Name and Date of Birth of students and also find number of students in each department.**

Phase 2:

Modify the 'Student' table to add a new field 'Grade'.

List the names of faculties who teach for a specific course using sub-query.

Phase 3:

Create a cursor to modify the salary of 'Professors' belonging to all departments by 150%.

Phase 4:

Develop a JAVA/PHP application that allows addition, deletion and modification of all table data and generate reports.

Diploma in Computer Engineering
Revision 2015
Syllabus
Semester - IV

semester IV										
S. No	Code	Course	Course Category	Periods per week			Credits	Type	Evaluation	
				Theory	Practical	Total			CA	External
1	4132	Data Communication	B	4	0	4	4	T	50	100
2	4134	Operating Systems	A	4	0	4	4	T	50	100
3	4133	Data Structures	A	5	0	5	5	T	50	100
4	4131	Computer System Hardware	A	4	0	4	4	T	50	100
5	4139	System Administration Lab	B	0	6	6	3	P	50	50
6	4138	Data Structures Lab	A	0	6	6	3	P	50	50
7	4137	Computer System Hardware Lab	A	0	6	6	3	P	50	50
8	4136	Application Development using Java	A	1 Week			5	P	50	50
				17	18	35	31			

COURSE TITLE : DATA COMMUNICATION
COURSE CODE : 4132
COURSE CATEGORY : B
PERIODS/WEEK : 4
PERIODS/SEMESTER : 60
CREDITS : 4

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Concepts of Data Communication	15
2	Physical Layer	15
3	Transmission Media	15
4	Data Link Layer	15

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	Understand the concept of Data Communication
	2	Understand the concept of networks
	3	Understand the concept of network model
2	1	Understand Data and Signals
	2	Understand Digital and Analog Transmission
	3	Understand Bandwidth Utilization -Multiplexing
3	1	Understand Guided and Unguided transmission media
	2	Understand Switched Networks.
4	1	Understand Error Detection and Correction
	2	Understand Data Link Controls

Specific Outcomes:

Module I. Overview of Data Communication and Networking.

1.1 Understand the concept of Data Communication.

- 1.1.1 Explain data communication concepts.
- 1.1.2 Explain briefly components of data communication.
- 1.1.3 Discuss different data representation forms.
- 1.1.4 Discuss different data flow methods.

1.2 Understand the concept of networks.

- 1.2.1 Define different network attributes.
- 1.2.2 Discuss different physical structures of network.
- 1.2.3 Discuss categories of networks.
- 1.2.4 Explain interconnection of Networks.
- 1.2.5 Define protocol.
- 1.2.6 Discuss various standards.

1.3 Understand the concept of network model

- 1.3.1 Discuss the layered approach.
- 1.3.2 Explain ISO OSI layered architecture.
- 1.3.3 Describe the functions of layers in OSI model.

Module II. The Physical Layer.

2.1 Understand Data and Signals.

- 2.1.1 Differentiate Analog and Digital Data and signals.
- 2.1.2 Explain Periodic analog signals.
- 2.1.3 Define the terms sine wave, Phase, Wave length, time and frequency domains, and bandwidth.
- 2.1.4 Explain Digital signals.
- 2.1.5 Define the terms bit rate and bit length.
- 2.1.6 Describe digital signals transmission.
- 2.1.7 Describe Transmission impairments and various types.

2.2 Understand Digital and Analog Transmission

- 2.2.1 Explain Analog to Digital Conversion
- 2.2.2 Explain Transmission modes
- 2.2.3 Explain Digital to Analog Conversion
- 2.2.4 Explain Analog to Analog Conversion.

2.3 Understand Bandwidth Utilization -Multiplexing

- 2.3.1 Explain Frequency Division Multiplexing.
- 2.3.2 Explain Wavelength Division Multiplexing.
- 2.3.3 Explain Time Division Multiplexing.

Module III. The Transmission Media.

3.1 Understand Guided transmission media.

- 3.1.1 Explain about Twisted pair cable.

3.1.2 Explain about Coaxial Cable.
3.1.3 Explain about Optical fiber cables.

3.2 Understand Unguided media.
3.2.1 Describe wireless propagation.
3.2.2 Describe Radio Waves.
3.2.3 Describe Micro Waves.
3.2.4 Describe Infrared Waves.

3.3 Understand Switched Networks.
3.3.1 Explain Circuit switched Networks.
3.3.2 Explain Packet switching – datagram, virtual circuit.
3.3.3 Explain the structure of a switch.

Module IV. Data Link Layer Services

4.1 Understand Error Detection and Correction
4.1.1. Define Key terms related to error detection and correction.
4.1.2. Explain different coding schemes
4.1.3. Discuss block codes
4.1.4. Discuss cyclic codes
4.1.5. Explain error detection and correction methods
4.1.6. Explain check sum error detection
4.1.7. Explain forward error correction methods

4.2 Understand Data Link Controls
4.2.1. Explain the framing concepts
4.2.2. Discuss flow and error control
4.2.3 Discuss Data link layer protocols
4.2.4 Explain HDLC
4.2.5 Explain point to point protocol

4.3 Understand random access protocols like ALOHA, CSMA, CSMA/CD

CONTENT DETAILS

MODULE I – CONCEPTS OF DATA COMMUNICATION

Concepts – components of communication - representation- text, numbers, images, audio, video – Data flow – simplex, half duplex, full duplex – Network attributes – performance, reliability, security – Physical structure – type of connections, topology – Categories – LAN, WAN, MAN – Inter connection - circuit, packet – protocols – standards – layered approach – ISO OSI model – functions of layers.

MODULE II – PHYSICAL LAYER

Analog and digital – data, signals – Periodic analog signals – sine wave, phase, wave length, time and frequency domains, bandwidth – digital signals – bit rate, bit length – digital transmission – base band, broad band – impairments – attenuation, distortion, noise – analog to digital – PCM– Transmission modes – parallel, serial , asynchronous, synchronous – digital to analog – ASK, FSK, PSK – analog to analog – AM, FM, PM – Multiplexing – FDM, WDM, TDM

MODULE III – TRANSMISSION MEDIA

Guided – twisted pair, co-axial, fiber optic – unguided – wireless – radio, micro wave, infrared – switched networks – circuit switched – packet switched – datagram, virtual circuit – switch – structure – space division – time division – structure of packet switch

MODULE IV – DATA LINK LAYER SERVICES

Error detection and correction – terms – types of errors, redundancy, detection versus correction, coding – coding schemes – block code , parity check – cyclic codes – CRC– check sum – forward error correction –framing – character oriented, bit oriented – flow and error control – DLL protocols – Simple, Stop and wait – HDLC – Point to point protocol– ALOHA, CSMA, CSMA/CD.

Text Book(s):

1 . Data Communications and Networking – Behrouz A. Forouzan – McGraw Hill Edn.-Fourth Edition/Fifth Edition

REFERENCES:

1. Computer Networks – Andrew S. Tanenbaum – Prentice Hall-Fifth Edition
2. Data Communication & Networks - William Stalling- Prentice Hall-Tenth Edition
3. Data Communications, Computer Networks and Open Systems –Fred Halsall , Addison-Wesley, 1996

COURSE TITLE	**:**	**OPERATING SYSTEMS**
COURSE CODE	**:**	**4134**
COURSE CATEGORY	**:**	**B**
PERIODS/WEEK	**:**	**4**
PERIODS/SEMESTER	**:**	**60**
CREDITS	**:**	**4**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Introduction to Operating System	**15**
2	Process Management	**15**
3	Memory Management	**15**
4	File Systems and I/O Systems	**15**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	To understand The concept of System Software
	2	To Understand Operating System
2	1	To understand process and threads
	2	To understand CPU scheduling
3	1	Understand memory management
	2	Understand virtual memory
4	1	Understand the file system
	2	Understand I/O systems

Specific Outcomes:

Module I - INTRODUCTION TO OPERATING SYSTEM.

1.1 To understand the Concept of System Software
- 1.1.1 State system software.
- 1.1.2 Discuss assembler and its functions
- 1.1.3 Discuss loader and its functions
- 1.1.4 Discuss compilers and interpreters and their functions
- 1.1.5 Discuss operating system and its functions

1.2 To Understand operating systems
- 1.2.1 Discuss different features of operating systems
- 1.2.2 List the functions of Operating Systems
- 1.2.3 Discuss batch systems
- 1.2.4 Discuss multiprogramming systems
- 1.2.5 Discuss time sharing
- 1.2.6 Describe multiprocessor systems
- 1.2.7 Describe real time systems
- 1.2.8 Discuss Unix, Windows, and Linux operating systems

MODULE II: PROCESS MANAGEMENT

2.1 To Understand processes and threads
- 2.1.1 Define process
- 2.1.2 Desribe process control block (PCB) and its general structure.
- 2.1.3 Explain the different states of a process with the help of state diagram.
- 2.1.4 Define a thread
- 2.1.5 Compare between threads and processes
- 2.1.6 Explain multi-threading.

2.2 To Understand CPU scheduling
- 2.2.1 Discuss about various schedulers – long, medium and short term.
- 2.2.2 Explain context switching
- 2.2.3 Describe CPU and I/O burst cycles
- 2.2.4 Explain CPU bound and I/O bound processes
- 2.2.5 Discuss the difference between preemptive and non-preemptive scheduling
- 2.2.6 Discuss various scheduling criteria
- 2.2.7 Explain FCFS, SJF, Priority, and RR scheduling algorithms and their Gantt charts
- 2.2.8 Discuss Multilevel queue and Multilevel feedback queue scheduling

2.3 To Understand Process synchronization
- 2.3.1 Discuss co-operating processes
- 2.3.2 Explain race condition
- 2.3.3 Explain critical section of processes
- 2.3.4 Define Critical Section Problem and its solutions
- 2.3.5 Explain resource allocation graphs
- 2.3.6 Explain deadlock and its causes
- 2.3.7 Discuss deadlock avoidance, prevention and detection & recovery.

MODULE III: MEMORY MANAGEMENT

3.1 To Understand memory management
- 3.1.1 Discuss different address bindings – compile, link and run time bindings
- 3.1.2 Differentiate the logical address and physical address.
- 3.1.3 Explain contiguous memory allocation – fixed partition and variable partition
- 3.1.4 Explain first fit, best fit and worst fit allocation strategies
- 3.1.5 Define fragmentation – internal and external, and suggest solutions
- 3.1.6 Explain paging and paging hardware
- 3.1.7 Discuss segmentation, and the advantages of segmentation over paging

3.2 Understand virtual memory
- 3.2.1 Discuss the concept of virtual memory
- 3.2.2 Explain demand paging
- 3.2.3 Explain page-faults and how to handle page faults.
- 3.2.4 Discuss page replacement algorithms: FIFO, optimal, LRU,
- 3.2.5 Explain the concept of thrashing

MODULE IV: FILE SYSTEMS AND I/O SYSTEMS

4.1 Understand the file system
- 4.1.1 Discuss the concept of file and directory
- 4.1.2 Discuss the various file operations
- 4.1.3 Describe the file organization concepts – sequential and indexed
- 4.1.4 Explain about different directory structures – single level, two-level, and tree structured directories
- 4.1.5 Explain about different allocation methods – contiguous, linked and indexed allocations

4.2 Understand Virtualization
- 4.2.1 Discuss the concept of virtualization
- 4.2.2 Discuss different types of virtualization
- 4.2.3 Discuss the overview of Vmware
- 4.2.4 Explain virtual Box
- 4.2.5 Explain about thin client

CONTENT DETAILS

MODULE I

Introduction to systems software – assembler, loader, compilers, interpreters and their functions. Operating system – definition - goals of OS - different types of Operating Systems - batch systems - multiprogramming systems - time sharing - multiprocessor systems - real time systems. Comparison of DOS, Unix, Windows, and Linux operating systems - Operating System components

MODULE II

Define process - process control block (PCB) and its general structure - different states of a process with the help of state diagram.- Define a thread – Comparison between threads and processes. - Multi-threading.

Schedulers – long, medium and short term- queuing diagrams. - context switching. CPU and I/O burst cycles - CPU bound and I/O bound processes- difference between preemptive and non-preemptive scheduling- Various scheduling criteria - FCFS, SJF, Priority, and RR scheduling algorithms and their Gantt charts - Multilevel queue and Multilevel feedback queue scheduling

Process synchronization - Co-operating processes - Race condition - Critical section of processes - Critical Section Problem and its solutions- Resource allocation graphs - Deadlock and its causes – Deadlock avoidance, prevention and detection &recovery.

MODULE III

Memory management - Different address bindings – compile, link and run time bindings. - Difference between logical address and physical address - Contiguous memory allocation – fixed partition and variable partition – Allocation Strategies - first fit, best fit and worst fit - Define fragmentation – internal and external, and suggest solutions - Paging and paging hardware - Segmentation, and the advantages of segmentation over paging

Concept of virtual memory - Demand paging - Page-faults and how to handle page faults. - Page replacement algorithms: FIFO, optimal, LRU, LRU Approximation, Counting based (LFU and MFU) - Learn the concept of thrashing

MODULE IV

File system - Concept of file and directory - Various file operations - File organization concepts – sequential and indexed. Different directory structures – single level, two-level, and tree structured directories. - Different allocation methods – contiguous, linked and indexed allocations.

Virtualization : Need of virtualization – cost , administration , fast deployment , reduce infrastructure cost – limitations.. Types of hardware virtualization: Full virtualization - partial virtualization - para virtualization. Desktop virtualization: Software virtualization – Memory virtualization - Storage virtualization – Data virtualization – Network virtualization..Vmware features and infrastructure – Virtual Box - Thin client

Text Book(s)

1. Operating System Concepts – Abraham Silberschatz, Peter Gaer Galvin and Greg Gagne. Wiley Publicaions-Eighth Edition
2. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert Elsenpeter TATA McGraw- Hill , 2010

References

1. Operating Systems-Internals and Design Principles – William Stallings . – PEARSON Publicaions- **Seventh Edition**
2. Operating Systems - Rohit Khurana, Vikas Publbishing-Second Edition
   Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online - Michael Miller - Que 2008

COURSE TITLE	**:**	**DATA STRUCTURES**
COURSE CODE	**:**	**4133**
COURSE CATEGORY	**:**	**A**
PERIODS/WEEK	**:**	**5**
PERIODS/SEMESTER	**:**	**75**
CREDITS	**:**	**5**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	**STACK AND QUEUE**	**19**
2	**LIST AND LINKED LIST**	**19**
3	**TREES**	**19**
4	**GRAPH**	**18**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	**1**	Introduction to different Data Structures
	2	Understanding Stack and its operations
	3	Understanding Queues and its operations
2	**1**	Understanding list and its operations
	2	Understanding linked list and its operations
3	**1**	To understand non linear data structure - trees
4	1	To understand non linear data structure - graphs
	2	To understand different sorting and searching concepts

Specific outcomes:

MODULE I STACK AND QUEUE

1.1 Introduction to different Data Structures

- 1.1.1 Explain efficiency of algorithms, complexity and big O notation.
- 1.1.2 Describe different data structures-linear and non linear
- 1.1.3 Describe basic data structure operations – insertion, deletion, search, traverse
- 1.1.4 Explain about Abstract Data Types (ADTs) and C++ classes
- 1.1.5 Explain the use of iterators
- 1.1.6 Describe the Array as an ADT with printArray() operation.

1.2 Understanding Stack and its operations

- 1.2.1 Describe Stack and its operations - Push and Pop.
- 1.2.2 Explain about array representation of stacks
- 1.2.3 Describe Stack ADT with push(), pop(), stackfull() and stackempty()

1.2.4 Describe infix, prefix and postfix Expressions
1.2.5 Explain infix to postfix conversion using Stack ADT
1.2.6 Explain evaluation of postfox expression using stack ADT

1.3 Understanding Queues and its operations
1.3.1 Describe Queue and its operations – Insert and Delete.
1.3.2 Describe circular queue and its array representation
1.3.3 Describe Queue ADT (for circular queue) with insert(), delete(), QEmpty() and QFull().
1.3.4 Describe Priority Queue and Dequeue

MODULE II LIST AND LINKED LIST

2.1 Understanding list and its operations
2.1.1 Describe list (using array) and its operations – Find, MakeEmpty, PrintList etc.
2.1.2 Describe List ADT with find(), makeEmpty(), printList(), findKth() etc.

2.2 Understanding linked list and its operations
2.2.1 Explain linked list and its operations – Find, MakeEmpty, PrintList, FindKth, Insert, Delete, Successor, Predecessor etc.
2.2.2 Describe the methods of memory allocation and deallocation for nodes.
2.2.3 Describe LinkedList ADT with find(), makeEmpty(), printList(), findKth(), insert(), delete() etc.
2.2.4 Describe algorithm for implementing stack with LinkedList ADT.
2.2.5 Describe algorithm for implementing queue with LinkedList ADT.
2.2.6 Discribe about doubly linked lists and circular linked lists.

MODULE III TREES

3.1 Understanding Trees and its operations
3.1.1 Explain binary tree, key terms related to trees and traversal methods.
3.1.2 Explain Linked representation of binary trees
3.1.3 Explain binary search trees (BST) and its operations – traversals, insertion, deletion and find.
3.1.4 Describe BST ADT with inOrder(), preOrder(), postOrder(), insert(), delete(), find() etc.
3.1.5 Describe Expression trees and Threaded binary trees.

MODULE IV GRAPH

4.1 Understanding Graph and its operations
4.1.1 Explain graph and key terms related to graphs
4.1.2 Explain graph representations – adjacency matrix mehod and adjacency list method.
4.1.3 Describe graph traversals – DFS and BFS
4.1.4 Describe Graph ADT with dfs() and bfs() methods.
4.1.5 Describe and implement Warshall's algorithm for all-pairs shortest path

4.2 Understanding Searching and Sorting
4.2.1 Explain and implement linear search and binary search algorithms
4.2.2 Explain and implement bubble sort and quick sort algorithms

CONTENT DETAILS

MODULE I : STACK AND QUEUE

Efficiency of algorithm-complexity- Data structures-linear and non linear-insertion, deletion, search, traverse- Iterators- Abstract Data Types (ADTs) – Array as an ADT .

Stack- representation- stack as an ADT - push() and pop() operations -Infix, Prefix, Postfix Expressions- Applications of stack-infix to postfix conversion-postfix evaluation.

Queue-Array representation of circular queue- queue as an ADT - insert() and delete() operations - Priority Queue and Dequeue.

MODULE II : LIST AND LINKED LIST

List using array – List ADT – find(), makeEmpty(), printList() and findKth() operations. Linked List - Memory allocation and de-allocation – LinkedList ADT – find(), makeEmpty(), printList(), findKth(), insert() operations – stack with LinkedList, queue with LinkedList – doubly linked list and circular list

MODULE III : TREES

Binary trees – key terms - Linked representation -binary search trees, BST ADT- inOrder(), preOrder(), postOrder(), insert(), delete(), find() operations – Expression trees and Threaded binary trees

MODULE IV : GRAPH

Graph Definition- Key terms - Representations – Traversal Algorithms – BFS,DFS – Graph ADT – All-pairs Shortest Path Algorithm.

Searching and Sorting Algorithms-Linear search and Binary search - Bubble sort and Quick sort algorithms.

TEXTBOOK

1. Fundamentals of Data Structures in C++, E.Horowitz- S.Sahni, Galgotia-2006
2. Data Structures and Algorithm Analysis in C++, M.A.Weiss, Pearson Education-Fourth Edition

REFERENCES

1. Data Structures, Algorithms and Applications in C++, Sartaj Sahni, University Press
2. **Data Structures using C and C++ by Yedidyah Langsam, Moshe J. Augenstein and Aron M. Tananbaum, PHI.2002**

COURSE TITLE : COMPUTRE SYSTEM HARDWARE
COURSE CODE : 4131
COURSE CATEGORY : A
PERIODS/WEEK : 4
PERIODS/SEMESTER : 60
CREDITS : 4

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Inside PC	15
2	Power supply & Storage devices	15
3	External Peripherals	15
4	Laptops and other Portable devices	15

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	To understand the working of Personal Computer
	2	To understand the working and the components of Motherboard
2	1	To understand Powering up of Computer
	2	To understand Secondary Storage Devices
3	1	To understand Different Peripherals and Expansion
	2	To understand Different custom configuration PCs and Workstations
	3	To understand the Installing and Configuring Printers
4	1	To understand Laptops
	2	Describe portable computing devices

Specific Outcomes:

MODULE –I Inside PC

1.1 To understand the working of Personal Computer
- 1.1.1 To describe the working of Personal Computer
- 1.1.2 To list the major connectors and services of a typical PC

1.2 To understand the working and the components of Motherboard
- 1.2.1 To explain how the motherboard works
- 1.2.2 To explain the components of Motherboard
- 1.2.3 To explain the characteristics of Memory
- 1.2.4 To identify the different types of DRAM packaging
- 1.2.5 To explain the varities of RAM
- 1.2.6 To explain the varities of a modern CPU

1.2.7 To describe the relationship of CPU & Memory
1.2.8 To explain the function of BIOS
1.2.9 To distinguish among various CMOS setup utility options
1.2.10 To describe option ROM and device drivers

MODULE – II Power supply & Storage devices

2.1 To understand Powering up of Computer
2.1.1 To describe the Purpose and characteristics of Power Supplies
2.1.2 Toexplain the details about powering the PC
2.2 To understand Secondary Storage Devices
2.2.1 To describe the Purpose and characteristics of Storage Devices
2.2.2 To explain how hard drives work
2.2.3 To explain the PATA and SATA hard drive interfaces
2.2.4 To explain SCSI hard drive Interface
2.2.5 To describe how to protect data with RAID
2.2.6 To describe the procedure for partitioning and formatting HDD
2.2.7 To list the variations among flash drives and other tiny devices
2.2.8 Todescribe Disk mirroring and disk duplexing

MODULE – III External Peripherals

3.1 To understand Different Peripherals and Expansion
3.1.1 To explain the Installing and Configuring Expansion Cards
3.1.2 To list the characteristics of Connectors and Cables
3.1.3 To explain the operation of various Input Devices
3.1.4 To explain the operation of various output Devices
3.1.5 To describe the Display types and its settings
3.2 To understand Different custom configuration PCs and Workstations
3.2.1 To explain the organisation of CAD/ CAM design Workstations, Audio Video editing Workstations, Virtualisation Workstations, Gaming PCs, Hometheatre PCs, Standard Thick clients, Thin clients, Home Server PCs, etc.
3.3 To understand the Installing and Configuring Printers
3.3.1 To list and explain the printer types and the process involved
3.3.2 To describe the installation and configuration of printers

MODULE –IV Laptops and other Portable devices

4.1 To understand Laptops
4.1.1 To describe the Laptop architecture
4.1.2 To explain the procedure for Disassembling and Reassembling of laptops
4.2 To Describe portable computing devices

CONTENT DETAILS

MODULE –I Inside PC

Working of PC- Motherboard- Foam factors-Components of Motherboard- Bus Architecture- Chipsets- Expansion Slots- Memory slots and Cache- CPU and Processor socket- BIOS and POST- CMOS and CMOS Battery- Purpose and characteristics of

Processors- Characteristics of Memory- types of memory- different types of DRAM- varities of RAM- Memory packaging

MODULE – II Power supply & Storage devices

Purpose and characteristics of Power Supplies- power connectors- Replacement of Power Supplies

Purpose and characteristics of Storage devices- HDD Systems- Solid state Drives- Optical storage drives-Drive interfaces and RAID- SCSI Drives- Removable storage and media- Flash memory- Externally attached drives- Installing, Removing, andconfiguring storage devices

MODULE – III External Peripherals

Installing and Configuring Expansion Cards- Video- Multimedia- I/O- Communications- Characteristics of Connectors and Cables- Device connector types- Common peripheral Cables and their Interfaces- Video display Cables and connectors- Input devices- Mouse- Keyboard- scanner- Barcode reader-digitizer-Biometric devices- Touch screens- Gamepads and Joysticks- Multimedia input devices- Web cams- MIDI devices- Digital Cameras and Camcoders- Output devices- Printers- Speakers- Display devices- Display types and settings- Video display Types- Adhusting display settings- Video standards and Technologies- Advanced Video resolutions and concepts

CAD/ CAM design Workstations-Audio Video editing Workstations- Virtualisation Workstations- Gaming PCs- Hometheatre PCs- Standard Thick clients- Thin clients- Home Server PCs

Printer types- Impact Printers- Inkjet- Laser Priners-Installing and configuring printers

MODULE –IV Laptops and other Portable devices

Laptop architecture- Laptop vs. Desktops- Motherboards and Processors- Memory- Input devices- Expansion Buses and Ports- Docking stations- Power systems- Laptop displays- Disassembling and Reassembling of laptops

Netbooks- Ultrabooks- Tablet PCs- Features and capabilities of Mobile Devices- Touchscreen technology- Enhancing Hardware- Configuration- Security

TEXT BOOK(S)

1. Computer Installation and Servicing D.Balasubramanian TataMc-Graw Hill, New Delhi 2010
2. Troubleshooting, Maintaining and Repairing PCs Stephen J.Bigelow TMH, New Delhi Fifth Edition

REFERENCES

1. PC Repair and Maintenance Joel Rosenthal- Fire wall Media,First Edition
2. Comdex Hardware and Networking Course Kit Vikas Gupta DreamTech Press -2011
3. Modern Computer Hardware Course Manahar Lotai,Pradeep Niar,BPB Publication ,2011
4. Troubleshooting, Maintaining and Repairing PCs Stephen J.Bigelow TMH, New Delhi Fifth Edition
5. PC Hardware in a nutshell Robert Bruce and Co O' Reilly, Shroff Publishers and Distributors -2008.

COURSE TITLE	**:**	**SYSTEM ADMINISTRATION LAB**
COURSE CODE	**:**	**4139**
COURSE CATEGORY	**:**	**B**
PERIODS/WEEK	**:**	**6**
PERIODS/SEMESTER	**:**	**90**
CREDITS	**:**	**3**

Course General Outcomes:

Sl.	G.O	Student will be able
1	1	Install any Two Server Operating Systems
	2	Server Configuration
2	1	Design a Server Active Directory forest
3	1	Install and configure server hardware devices
4	1	Monitor server hardware
	2	Manage storage

Software Requirement: Linux Operating System, Any Other Server Software Like Windows server

PART – A LINUX COMMANDS

Write down the syntax and usage of the following exercise with all options. Check the commands with the system

1 (a) Logon to Linux and logoff.
(b) Usage of directory management commands: l*s, cd,pwd, mkdir,rmdir*
(c) Usage of File Management commands: cat, chmod,cp,mv,rm, *more, f*ile commands
2. Use the general purpose commnds: *wc, od, lp, cal , date, who , tty ,ln*
3. Using the simple filters: pr, head, tail, cut, paste, nl, sort
4. Advanced filters : Search for a pattern using *grep, egrep & fgrep*
5. To know the details of process status- *ps* command , Process management commands: &, nohup, kill, nice
6. Communication Commands: news, write, mail, wall, calendar
7. Device pattern using meta character to match each of the following situation:-
a. All two character filenames.
b. All filenames consisting of two lowercase letters.
c. All filenames ending with c.
d. All filenames beginning with a *c* and ending with a digit.
e. All filenames beginning with *p* and having at somewhere.

PART – B SHELL SCRIPTS

1. Write a shell-script that accepts a numerical value N. Then display the decrementing value of N till it reaches 0.

2. Write a shell-script that takes three command line arguments. The first argument is the name of the destination file and the other two arguments are names of files to be placed in the destination file.
3. Write a Shell script to print contents of file from given line number to next given number of lines
4. a)Shell script to say Good morning/Afternoon/Evening as you log in to system
   b)Write a shell-script that print out date information in this order: time, day of the week, day number, year – that is like this. 13:55:00 IST Sun 9 Jun 2015
5. Write a shell-script that tells you its name and PID
6. Develop a Basic math Calculator using case statement
7. Write a shell-script that takes a login name as a command line argument and reports to you when that person logs in. Have it sent a greeting to that person.
8. Write a shell-script that takes a command line argument and reports on whether it is a directory, a file or something else.

PART – C LINUX SERVER EXPERIMENTS

1. Installation of Linux using Graphical mode.
2. Installation of Linux using command prompt
3. Creating a user in Linux server and assigning rights
4. a) Configuring and Troubleshooting of /etc/inittab.
   b) Configuring and Troubleshooting of /etc/passwd
5. Configuring and Troubleshooting of /etc/grub.conf
6. Linux TCP/IP Network Configuration
7. Installation of additional software
8. File Data Backup using tar

PART – D SERVER EXPERIMENTS

1. Installation of s Server.
2. Installing Hardware, Devices and Drivers using Device manager and Driver Query
3. Configure Active Directory Services, create a user and assign permissions using Logon Script and Group permissions.
4. Automated installation of Server using answer files.
5. Installing required server components using Control panel.
6. Installation and configuration of DHCP server.
7. Configuring Disks and Volumes and Managing disks and volumes from the command prompt.
8. Installation and Configuration of Mail Server in server environment.
9. Establish RAID configuration on server.
10. Configure a router to connect two different networks and transfer files between them.

COURSE TITLE	**:**	**DATA STRUCTURES LAB**
COURSE CODE	**:**	**4138**
COURSE CATEGORY	**:**	**A**
PERIODS/WEEK	**:**	**6**
PERIODS/SEMESTER	**:**	**90**
CREDITS	**:**	**3**

List of Experiments

1. Implement Stack ADT using array.
2. Implement an algorithm to convert infix to postfix expression using Stack ADT
3. Implement an algorithm to evaluate a postfix expression using stack ADT
4. Implement an algorithm to convert decimal number to its binary equivalent using stack ADT
5. Implement a Queue ADT (circular queue) using array.
6. Implement a List ADT (using array) with operations find(), makeEmpty(), printList(), findKth() etc.
7. Implement a LinkedList ADT with operations find(), makeEmpty(), printList(), findKth(), insert(), delete() etc.
8. Implement a stack using LinkedList ADT
9. Implement a queue using LinkedList ADT
10. Implement a Binary Search Tree ADT with operations inOrder(), preOrder(), postOrder(), insert(), delete(), find() etc.
11. Implement a BST using BST ADT and find height of the tree
12. Implement a BST using BST ADT and dermine the number of nodes
13 Implement Graph ADT with operations dfs() and bfs()
14. Implement Warshall's algorithm to find the shortest path using Graph ADT
15. Implement binary search algorithm
16. Implement Quick sort algorithm

Software Requirement : Linux operating System and gcc/g++

COURSE TITLE	:	**COMPUTRE SYSTEM HARDWARE LAB**
COURSE CODE	:	4137
COURSE CATEGORY	:	A
PERIODS/WEEK	:	6
PERIODS/SEMESTER	:	90
CREDITS	:	3

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	**1**	Assembling and Disassembling desk top machine
2	**1**	Different peripheral Installation and Servicing:
3	**1**	Computer Servicing practical
4	1	Assembling and Disassembling lap top

Specific Outcomes:

PART A – COMPUTER SERVICING PRACTICALS

1. Identification of System Layout.
   a) Front panel indicators & switches and Front side & rear side connectors.
   b) Familiarize the computer system Layout:Marking positions of SMPS, Motherboard, FDD, HDD, CD, DVD and add on cards.
   c) Configure BIOS setup program and troubleshoot the typical problems using BIOS utility.
2. HARD DISK
   a) Install Hard Disk.
   b) Configure CMOS-Setup.
   c) Partition and Format Hard Disk.
   d) Identify Master /Slave / IDE Devices.
   e) Practice with scan disk, disk cleanup, disk De-fragmenter, Virus Detecting and Rectifying Software.
3. a) Install and Configure a DVD Writer and a Blu-ray Disc writer.
   b) Recording a Blank DVD and Blu-ray Disc.
4. Printer Installation and Servicing:
   a) Head Cleaning in dot matrix printer
   b) Install and configure Dot matrix printer and Laser printer
   c) Troubleshoot the above printers.
   d) Check and connect the data cable connectivity
5. Install and configure Scanner, Web cam, Cell phone and bio-metric device with system. Troubleshoot the problems
6. Assemble a system with add on cards and check the working condition of the system and install OS.
7. Dual OS Installation
8. Assembling and Disassembling of Laptop to identify the parts and to install OS and configure it.

Hardware Requirement: Desk Top Computer components and Lap Top components

COURSE TITLE	**:**	**APPLICATION DEVELOPMENT USING JAVA**
COURSE CODE	**:**	**4136**
COURSE CATEGORY	**:**	**A**
PERIODS/WEEK	**:**	**5 Days**
PERIODS/SEMESTER	**:**	**35**
CREDITS	**:**	**5**

Software Requirement: Java with GUI

General Outcomes:

To develop a menu driven, GUI based user friendly database application using Java

Specific Outcomes:

To Understand Fundamentals of GUI Programming

1.1. Familiarisation with an IDE (such as Eclipse / net beans / qt)
1.2. Use of Controls such as buttons, text filed, text area, check box, radio buttons, lists, scroll bar, list box, combo box etc
1.3. Concept of Event Handling
1.4. Develop simple programs using the above controls.

To explore the features of Advanced GUI Programming

2.1 Develop menu driven programs - menus, menu bar, menu items, main menu
2.2 Implement Dialog boxes in programs

[Note : At the end this module, students shall design and develop the user interfaces, menus for their application]

To Implement Database Connectivity

3.1 Implement database integration in applications - store, retrieve, modify databases from applications.
3.2 Implementation of database operations with necessary programming structures

[Note : At the end this module, students shall design the database for their application and incorporate necessary database operations]

To Generate Reports

4.1 Implementation of general application features such search, reports, backup etc
4.2 Create report
4.3 Converting reports to other format such as PDF
4.4 Implement backup & restore facility
4.5 Create executable programs

[Note : At the end this module, students shall develop a complete database based application.]

Instructions :

A simple application may be developed in any one of the domains such as Banking, Electricity Billing, Library management, Payroll, Insurance, Inventory, Health care etc. Application should developed by using an IDE (such as eclipse, net beans, qt etc).

Programming language JAVA must be used.

The course content given above is a general outline. The contents may be rearranged in tune with IDE/ Programming language/ Database selected for this lab without losing the course objective.

The lab record should contain all interim programs developed by the student during the development of the main application. The main application should be the last experiment.

Before the end of semester, the student should develop a complete GUI based database application incorporating the features listed in the exercises above. In end semester examination the students will be evaluated based on the features listed above. Also the students have to demonstrate the database application software developed by them as part of the evaluation.

Diploma in Computer Engineering
Revision 2015
Syllabus
Semester - V

semester V										
S. No	Code	Course	Course Category	Periods per week			Credits	Type	Evaluation	
				Theory	Practical	Total			CA	External
1	5132	Project Management & Software Engineering	C	4	0	4	4	T	50	100
2	5133	Web Programming	A	4	0	4	4	T	50	100
3	5131	Microprocessor and Interfacing	A	4	0	4	4	T	50	100
4	5136	Information Security	E	4	0	4	4	T	50	100
	5135	Ethical Hacking	E	4	0	4	4	T	50	100
	5134	Cloud Computing	E	4	0	4	4	T	50	100
5	5139	Web Programming Lab	A	0	4	4	2	P	50	50
6	5138	Microprocessor Lab	A	0	4	4	2	P	50	50
7	5009	Industrial Training/Industrial Visit/Collaborative work	A	2 Week			2	P	50	0
8	5137	Computer Network Engineering Lab	A	0	5	5	3	P	50	50
9	6009	Project & Seminar	A	0	6	6	0	Pr	0	0
				16	19	35	25			

COURSE TITLE : PROJECT MANAGEMENT AND SOFTWARE ENGINEERING
COURSE CODE : 5132
COURSE CATEGORY : C
PERIODS/WEEK : 4
PERIODS/SEMESTER : 52
CREDITS : 4

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Phases of Software Development	**13**
2	Requirements Analysis and Design	**13**
3	Software Implementation and Testing	**13**
4	Software Project Management	**13**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	To understand the need of software engineering
	2	To know the phases of Software Development
	3	To understand various Lifecycle models
2	1	To understand requirement analysis and specifications
	2	To understand preparation of SRS document
	3	To understand Design Concepts
3	1	To understand software coding guidelines
	2	To understand software testing
4	1	To know Software Project Management
	2	To understand CMMI

Specific Outcomes:

MODULE – I Phases of Software Development

1. To Understand Phases and Life cycle models of Software Development
    1. Define software engineering and its importance
    2. Explain emergence of software engineering
    3. Describe Software Process
    4. State Phases of software development
    5. Describe Feasibility study
    6. Describe Requirement Analysis
    7. Describe Design phase
    8. Describe Implementation phase
    9. Describe testing phase
    10. Describe Maintenance phase
    11. Describe Life Cycle Models- Classical waterfall, Iterative, prototyping, Spiral and Agile
    12. Compare Life cycle models

MODULE – II Requirements Analysis and Design

1. To Comprehend the Requirements Analysis and Design
    1. Describe Software Requirement Analysis and its need
    2. Describe Requirements specification
    3. Describe the desirable characteristics of an SRS
    4. Explain structure of an SRS document
    5. Explain Data Flow Diagrams
    6. Explain the role of Software Architecture
    7. Describe how to plan for a Software Project
    8. Define Software Design
    9. Describe software design concepts
    10. Explain Function Oriented Design and its Complexity Metrics
    11. Explain Object Oriented Design and its Complexity Metrics
    12. Describe Detailed Design

MODULEIII Software Implementation and Testing

1. To Understand Software Implementation and Testing
    1. Explain Programming principles and coding guidelines
    2. Describe the method of incrementally developing code
    3. Explain how to manage the evolving code
    4. Define Software Testing
    5. Explain unit testing and Code Inspection
    6. Explain the testing concepts and testing process
    7. Design Test case and Test plan
    8. Describe Black-box testing
    9. Describe White box testing

MODULE – IV Software Project Management

1.1 To Understand the importance of Software Project Management
- 1.1.1 Explain Software Project Management Framework
- 1.1.2 Describe methods to Estimate project time and cost
- 1.1.3 Describe about Resource Management
- 1.1.4 Describe how Project Risks can be identified, analyzed, mitigated, and monitored
- 1.1.5 Describe how project quality can be ensured and managed
- 1.1.6 Describe about Configuration Management
- 1.1.7 Describe change management
- 1.1.8 Explain about CMMI, different levels and need of accreditation

CONTENT DETAILS

Module I: Phases and Life cycle models of Software Development

Software Engineering – importance – emergence - Phases of software development - Feasibility study, Requirement Analysis, Design, Implementation, Testing, and Maintenance phases
Software Life Cycle Models - Classical waterfall, Iterative, prototyping, Spiral, and Agile - Compare Life cycle models

Module II: Requirements Analysis and Design

Requirement Analysis – Analysis process, Requirements specification, desirable characteristics of an SRS, structure of an SRS document, Data Flow Diagrams - Role of Software Architecture and Architecture Views - Planning for a Software Project
Software Design - Software design concepts - Function Oriented Design and its Complexity Metrics - Object Oriented Design and its Complexity Metrics - Detailed Design.

MODULE III: Software Implementation and Testing

Software Coding - Programming principles and coding guidelines - method of incrementally developing code - managing the evolving code
Testing - Unit testing and Code Inspection - Testing concepts and testing process - Design of Test case and Test plan - Black-box testing - White box testing

MODULE IV: Software Project Management

Software Project Management Framework - methods to estimate project time and cost, Resource Management, Identification, Analysis, mitigation, and monitoring of Project Risks - Ensuring Project quality and quality management, Configuration Management, Change management, CMMI, different levels and need of accreditation

TEXT BOOK(S):

1. Software Engineering, A Precise Approach: Pankaj Jalote, Wiley India-2010
2. Software Project Management : Saikat Dutt /S. Chandramouli, Pearson-Second Edition

REFERENCE :

1. Software Engineering : Ian Sommerville, Pearson,Nineth Edition
2. Software Engineering a practitioners approach – Roger S Pressman,Seventh Edition
3. Project Management Absolute Beginner's Guide : Greg Horine , Pearson, Second Edition

COURSE TITLE	**:**	**WEB PROGRAMMING**
COURSE CODE	**:**	**5133**
COURSE CATEGORY	**:**	**A/E**
PERIODS/WEEK	**:**	**4**
PERIODS/SEMESTER	**:**	**52**
CREDITS	**:**	**4**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Internet Fundamentals and HTML	**13**
2	CSS & JAVASCRIPT	**13**
3	Server Side Scripting – PHP	**13**
4	Database Handling, Content Management System	**13**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	To Understand Internet Fundamentals and HTML
2	1	To Understand CSS & JAVASCRIPT
3	1	To Server Side Scripting – PHP
4	1	To Understand Database Handling, Content Management System

Specific Outcomes:

MODULE – I Internet Fundamentals and HTML

1.1 To Understand Internet Fundamentals and HTML

1.1.1. Define Internet, Internet Protocol Address, Domain Names
1.1.2. Explain World Wide Web
1.1.3. Differentiate between World Wide Web and Internet
1.1.4. Define Web Browsers, Web Servers with examples
1.1.5. Describe URL,MIME
1.1.6. Illustrate HTTP
1.1.7. Explain HTML & XHTML
1.1.8. Explain the format of a HTML page
1.1.9. Describe Elements and Attributes
1.1.10. Explain Basic tags, heading tags, paragraph tags, formatting tags
1.1.11. Define HTML List
1.1.12. Describe Hyperlink and anchor tag.
1.1.13. Describe how to use Table tags and its attributes
1.1.14. Describe how to use Frames and IFrames tags
1.1.15. Describe Form tag with all of its attributes
1.1.16. Differentiate between get and post methods
1.1.17. Describe how to use control tags in a Form
1.1.18. Describe how to Embed Multimedia objects into HTML pages
1.1.19. Design simple web pages containing using HTML tags

MODULE – II CSS & JAVASCRIPT

2.1 Understand CSS & JAVASCRIPT

2.1.1 Explain the use of Cascading Style Sheets (CSS)
2.1.2 Describe CSS syntax
2.1.3 Explain CSS selectors
2.1.4 Illustrate how to insert CSS in a web page - Inline, Embedded and External Style Sheets
2.1.5 Explain basic CSS properties – font, colour, background, list, link, text
2.1.6 Implement CSS in web pages
2.1.7 State the need for scripting languages
2.1.8 Define server side scripting and client side scripting
2.1.9 List client side scripting languages
2.1.10 Illustrate how JavaScript is used in an HTML page
2.1.11 Describe Programming elements in JavaScript
2.1.12 Describe Document Object Model
2.1.13 Explain how Event Handling is done using JavaScript
2.1.14 Explain how input data validations are done using JavaScript
2.1.15 Describe Dynamic Documents with JavaScript
2.1.16 Design web pages implementing event handling and input validations and dynamic elements

MODULE – III Server Side Scripting – PHP

3.1 Understand Server Side Scripting – PHP

3.1.1 Describe Server Side Scripting
3.1.2 List Server side scripting languages
3.1.3 State advantages of PHP
3.1.4 Describe how Apache, MySQL, and PHP are installed and configured
3.1.5 Describe how a PHP script is embedded in a webpage and executed
3.1.6 Describe PHP language elements
3.1.7 Describe Form Handling
3.1.8 Implement Session & Cookie Handling in PHP
3.1.9 Describe how Page Redirection and file uploading in PHP Implement File Uploading from a webpage
3.1.10 Describe File Handling in PHP
3.1.11 Implement file, form, cookie and session handling programs

MODULE – IV Database Handlingand Content Management System

4.1 Understand Database Handling, Content Management System

4.1.1 Describe how Databases are used
4.1.2 Describe how database connection is implemented
4.1.3 Describe how SQL Statements are executed from PHP script
4.1.4 Implement of database related applications in PHP
4.1.5 Implement simple websites using HTL, CSS, JavaScript, PHP & MySQL
4.1.6 Define Domain name Registration
4.1.7 Describe Server space hiring
4.1.8 Explain File Uploading procedure
4.1.9 Explain Web Hosting
4.1.10 List different Content Management tools
4.1.11 List advantages of Content management System
4.1.12 Case Study of CMS : Joomla
4.1.13 Explain the features of Joomla - The content structure, Templates, Menu Links, Components, Modules, Text editors, Permissions

CONTENT DETAILS

MODULE – I Internet Fundamentals and HTML

Internet - Internet Protocol Address - Domain Names - World Wide Web - Web Browsers - Web Servers – URL – MIME – HTTP
HTML- tags- attributes - table – form – frame - format tags- image tags - embedding multimedia

MODULE – II CSS & JAVASCRIPT

CSS - Java script – programming - event handling - data validation - dynamic documents – positioning elements, moving elements, element visibility, font and colour changing, dynamic content

MODULE – III Server Side Scripting – PHP

Server Side Scripting – Advantages of PHP – Installation & Configuration – PHP language elements - Data Types - Variables – Constants – Operators – Expressions - Control Structures - Arrays – Functions - Form Handling – Session – Cookie – page redirection – file uploading – file handling

MODULE – IV Database Handling and Content Management System

PHP Database Interface - Web Hosting - Content Management System - Case Study of CMS : Joomla - The content structure – Templates - Menu links – Components - Modules -Text editors – Permissions

TEXT BOOK(S)

1. Programming the World Wide Web -Robert W.Sebesta (Pearson Education) (Second Edition)

REFERENCE:

1. Beginning Web Programming with HTML, XHTML, CSS & JavaScript – John Duckett (Wiley DreamTech)-Second Edition
2. PHP and MySQL Web Development - Welling – (Pearson Education)-Fourth Edition
3. Sams teach Yourself PHP in 24 hours – Zandstra – (Pearson Education)-Third Edition
4. Joomla! 3 Explained: Your Step-by-Step Guide– Stephen Burge -(Pearson Education)- (2nd Edition)

COURSE TITLE : MICROPROCESSORS AND INTERFACING
COURSE CODE : 5131
COURSE CATEGORY : A
PERIODS/WEEK : 4
PERIODS/SEMESTER : 52
CREDITS : 4

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Basic 80x86 Architecture	**13**
2	Programming of x86 processor	**13**
3	Interrupt mechanism of x86 & Interfacing of chips	**13**
4	Advanced Processor Technologies	**13**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	To understand Microprocessors
	2	To know the architecture of 8086 Microprocessor
2	1	To understand the Programming of 8086
	2	To understand The Instruction set of x86 Processor
3	1	To understand the Interrupt mechanism of x86
	2	Interfacing with PPI & Keyboard and Display Controllers
4	1	To understand the operating Modes of 80386
	2	To study Pentium Processor and modern technologies

Specific Outcomes:

MODULE –I Basic 80x86 Architecture

1.1 To understand Microprocessors

1.1.1 To describe the role of Microprocessor in Micro Computer

1.1.2 To list the features of 8086

1.2 To know the architecture of 8086 Microprocessor

1.2.1 To Explain the architecture of 8086

1.2.2 To describe the software architecture of 8086

1.2.3 To describe the Hardware structure of 8086

MODULE – II Programming of x86 processor

2.1 To understand the Programming of 8086

2.1.1 To Describe Assembly language programming

2.2 To understand The Instruction set of x86 Processor

2.2.1 To describe data transfer, branch, and arithmetic instructions

2.2.2 To describe logical, shift , and rotate instruction

2.2.3 To describe string instructions and procedures

MODULE – III Interrupt mechanism of x86 & Interfacing of chips

3.1 To understand the Interrupt mechanism of x86

3.1.1 To describe interrupts of 8086

3.1.2 To explain the different types of interrupts

3.2 To Understand different Interfacing Chips

3.2.1 To describe Programmable Peripheral Interfacing Chip and Interfacing with x86 processor

3.2.2 To explain the importance, organisation, and interfacing of Programmable Interrupt Controller

3.2.3 To describe Keyboard and Display Interface chip and Interfacing with x86 processor

MODULE –IV Advanced Processor Technologies

4.1 To understand the operating Modes of 80386

4.0.1 To list the features of 80386

4.1.2 To describe Real Mode & Protected Virtual Addressing Mode

4.1 To Explain Pentium Processor

4.1.1 To list the features of Pentium

4.1.2 To describe pipelining

4.2 To know the advanced technologies of modern Intel processors

4.2.1 To define Super scalar Architecture

4.2.2 To define Multicore processing

4.2.3 To define MMX Technology

4.2.4 To define Hyperthreading

CONTENT DETAILS

MODULE –I Basic 80x86 Architecture

Role of Microprocessor in Micro Computer – Brief history of Microprocessors (with specific insight into x86 family) - Features of 8086

Internal Block Diagram of 8086 – Execution Unit – Bus Interface Unit – Addressing Modes

Hardware structure of 8086- Pin Configuration-Clock- Processor activities (Interrupt, DMA, etc.)- Maximum mode- Instruction cycle

Assembly process – Assemblers for x86 – Instruction Design

MODULE – II Programming of x86 processor

Data transfer Instructions- Branch instructions- Arithmetic instructions- Shift and Rotate Instructions- String Instructions- Procedures- Macros-Number Format Conversions- ASCII operations

MODULE – III Interrupt mechanism of x86 & Interfacing of chips

Interrupts of 8086- Dedicated Interrupt types- Software interrupts-Hardware interrupts- Priority of interrupts-Programmable Interrupt Controller (8259)

Organisation and Interfacing of PPI (8255), and Keyboard and display Interface (8279)

MODULE –IV Advanced Processor technologies

Features of 80386- Real Mode - Protected Virtual Addressing Mode

Features of Pentium- pipelining- Stages of pipelining- Speedup due to pipelining- Pipeline Hazards

Super scalar Processors- Multiple Execution units

Multicore processing – Major issuies in Multicore Processing (interconnects- cache coherance-snooping protocol- Directory based protocol) MMX- SSE- Hyperthreading

Note: The programming should be covered irrespective of Assembler.

TEXT BOOK(S):

1. The x86 Microprocessors- Architecture, Programming and Interfacing – Lyla B Das – Pearson- Second edition.
2. Microprocessor and Microcontroller - R. Theagarajan – SCITECH-2010

REFERENCES:

1. The 8088 and 8086 Microprocessors – Programming, Interfacing, Software and Hardware Applications by Walter A. Triebel & Avatar Singh, Pearson Fourth Edition,
2. Microprocessor 8086 Architecture, Programming and Interfacing by Sunil Mathur, PHI,2011
3. The Intel Microprocessors : Archirecture, Programming and Interfacing- Barry B. Brey Pearson -8 Edition

COURSE TITLE	**:**	**INFORMATION SECURITY**
COURSE CODE	**:**	**5136**
COURSE CATEGORY	**:**	**ELECTIVE**
PERIODS/WEEK	**:**	**4**
PERIODS/SEMESTER	**:**	**52**
CREDITS	**:**	**4**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	**Introduction to Computer Security & Cryptography**	**13**
2	**User Authentication & Access Control**	**13**
3	**Intrusion Detection and Malicious Software**	**13**
4	**Denial of Service and Firewall**	**13**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	Understand concepts of computer security
	2	Understand cryptographic tools
2	1	Understand user authentication
	2	Study authentication methods
	3	Understand access control in computer security
3	1	Understand intrusion and its detection methods
	2	Understand malicious software
4	1	Understand Denial of service
	2	Understand Firewall

Specific Outcome:

MODULE I: Introduction to computer Security & Cryptography

1.1 To understand the concept of Computer Security

- 1.1.1 Define computer Security.
- 1.1.2 Explain Computer Security triad: Confidentiality, Integrity, Availability.
- 1.1.3 Explain the terminologies: Authenticity, accountability.
- 1.1.4. Explain the Model of Computer Security, Security concepts and relationships.
- 1.1.4. Differentiate Threats and Attacks & Threats and Assets.
- 1.1.5 Explain various Security aspects in Communication Lines and Networks.
- 1.1.6 List security functional requirements.
- 1.1.7 Explain Security architecture for OSI.
- 1.1.8 Explain the Scope of Computer and Network Security with block diagram.
- 1.1.9. Discuss three aspects of computer security strategy.

1.2 To Comprehend Cryptographic Tools

- 1.2.1 Explain simplified model of symmetric encryption with block diagram.
- 1.2.3 Explain Symmetric block encryption algorithms.
- 1.2.3 Explain block and Stream Cipher encryption.
- 1.2.4 Explain message authentication with symmetric encryption
- 1.2.5 Describe message authentication without message encryption.
- 1.2.6 Explain message authentication with message authentication code (MAC) using figure.
- 1.2.7 Describe message authentication with one way hash functions
- 1.2.8 Explain Public key cryptography
- 1.2.9. Explain digital signature, public key certificates and Symmetric key exchange using public key encryption
- 1.2.10 Explain the use of Random numbers in encryption
- 1.2.11 Define pseudorandom numbers

MODULE II: User Authentication and Access Control

2.1 To understand User Authentication

- 2.1.1 Define User Authentication
- 2.1.2 Explain the means of authentication
- 2.1.3 Describe Password based Authentication
- 2.1.4 Explain Password attack strategies and countermeasures
- 2.1.5 Explain the use of hashed passwords
- 2.1.5 Explain the password cracking approaches and user password choices
- 2.1.6 Explain password File access control
- 2.1.7 Illustrate various password selection strategies

2.2 To Understand Various Authentication Methods

- 2.2.1 Explain Token based authentication
- 2.2.2 Explain Biometric Authentication
- 2.2.3 Explain various physical characteristics used in biometric applications
- 2.2.4 Explain the operation of a biometric authentication system
- 2.2.5 Explain the biometric accuracy
- 2.2.6 Discuss Remote User Authentication
- 2.2.7 Explain various security issues for user authentication

2.3 To understand Access control in computer security

- 2.3.1 Discuss Access Control Principles – Relationship among other security functions
- 2.3.2 Explain various access control policies

2.3.3 Discuss various access control requirements
2.3.4 Explain the various basic elements of Access control: subject, object and Access right
2.3.5 Illustrate the UNIX File Access Control

MODULE III: Intrusion Detection & Malicious Software

3.1 To Know Intrusion and Detection
3.1.1 List various classes of intruders and the intruder behavior patterns.
3.1.2 Explain the Intrusion Detection System classification and the requirements of IDS.
3.1.3 Explain Host based Intrusion detection
3.1.4 Explain the relevance of audit records, anomaly detection, and signature detection
3.1.5 Explain Distributed host based intrusion detection
3.1.6 Discuss Network based intrusion detection
3.1.7 Discuss Intrusion Detection Exchange Format
3.1.8 Explain the functioning of Honey pots
3.1.9 Explain the functioning of SNORT IDS – Architecture and rules

3.2 To Study about Malicious Software
3.2.1 Explain various types of Malicious Software
3.2.2 Discuss Viruses – The nature of viruses, Virus structure, Virus classification
3.2.3 Explain various Antivirus approaches & Antivirus techniques
3.2.4 Describe Study Worms- Worm propagation model, requirements for Worm Countermeasures
3.2.5 Discuss BOT and RCF
3.2.6 Discuss about Constructing the Attack Network
3.2.7 Explain ROOTKIT functions, classifications, installation

MODULE IV: Denial of Service and Firewall

4.1 To Understand Denial of Service
4.1.1 Define a Denial of Service (DoS)
4.1.2 Explain the effect of DoS on Network bandwidth, System resources and Application resources
4.1.3 Explain classic Denial of Service Attacks
4.1.4 Discuss about Source Address Spoofing
4.1.5 Explain the SYN Spoofing
4.1.6 Explain Flooding Attacks- ICMP Flood, UDP Flood, TCP SYN Flood
4.1.7 Explain the Distributed Denial of Service Attacks, and DDoS attack architecture
4.1.8 Discuss the Reflector and Amplifier attacks
4.1.9 Explain defenses against DoS Attacks, and how to respond to DoS Attacks

4.2. To Understand Firewall
4.2.1 List the need for firewall
4.2.2 List various characteristics of a Firewall
4.2.3 Discuss various types of firewalls:
4.2.4 Illustrate Bastion Host, Host based firewalls and Personal firewalls
4.2.5 Explain Internal and external Firewall Configuration
4.2.6 Explain Distributed Firewalls

CONTENT DETAILS

MODULE I : Introduction to Computer Security & Cryptography

Computer Security : Definition –Triad – Authenticity, Accountability – Model – Security concepts – relationships – Threats , Attack, Assets – Security aspects in communication lines and networks – Security requirements – OSI architecture – Scope – Strategy.

Cryptography : Symmetric encryption – Algorithms – Block and Stream Cipher encryption – Message authentication – MAC – One way Hash Function – Public key cryptography – digital signature – public key exchange – symmetric key exchange – Random numbers in encryption – pseudorandom numbers

MODULE II : User Authentication and Access Control

User Authentication: means of authentication - Password based Authentication - Password attack strategies and countermeasures - hashed passwords - password cracking - user password choices - password File access control - password selection.

Authentication Methods: Token based authentication -Biometric Authentication - physical characteristics in biometric applications - operation – accuracy - Remote User Authentication - security issues

Access control: Principles – Relationship among other security functions - access control policies - access control requirements - basic elements of Access control: subject, object and Access right - UNIX File Access Control

MODULE III : Intrusion Detection & Malicious Software

Intrusion and Detection: Classes of intruders - Intruder behavior patterns - classification - requirements of IDS - Host based Intrusion detection - audit records - anomaly detection - signature detection - Distributed host based intrusion detection - Network based intrusion detection - Intrusion Detection Exchange Format - Honey pots - SNORT IDS – Architecture and rules

Malicious Software: Different types - Viruses – nature - Virus structure – Classification - Antivirus approaches - Antivirus techniques – Worms - Propagation model - Worm Countermeasures - BOT – Uses - RCF, Attack Network - ROOTKIT – functions – classifications – installation.

MODULE IV : Denial of Service and Firewall

Denial of Service: Definition - Effect of DoS on Network bandwidth - System resources - Application resources -Classic Denial of Service Attacks - Source Address Spoofing - SYN Spoofing - Flooding Attacks - ICMP Flood - UDP Flood - TCP SYN Flood - Distributed Denial of Service Attacks - DoS attack architecture - Reflector and Amplifier attacks - Defenses against DoS Attacks – Response to DoS Attacks

Firewall: Need - Characteristics - Packet filtering - Stateful inspection - Application level - Circuit level gateway - Bastion Host - Host based firewalls - Personal firewalls - Internal and external Firewall Configuration - Distributed Firewalls

TEXT BOOK:

1. Computer Security- Principles and Practice - Author: William Stallings & Lawrie Brown
   Publisher: Pearson Prentice Hall 2010

REFERENCE BOOKS:

1. Cryptography and Security - Author: C K Chyamala, N Harini & Dr T R Padmanabhan
   Publisher: Wiley – India 2010
2. Network Security –**M.V. Arun Kumar**, USP2011 First Edition

COURSE TITLE : ETHICAL HACKING
COURSE CODE : 5135
COURSE CATEGORY : ELECTIVE
PERIODS/WEEK : 4
PERIODS/SEMESTER : 52
CREDITS : 4

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Vulnerabilities and Attacks	**13**
2	Hacking Techniques	**13**
3	Operating System Vulnerabilities	**13**
4	Hacking Web Servers and Wireless Networks	**13**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	Understand ethical hacking concepts
2	1	Understand the hacking techniques and tools
3	1	Understand the various vulnerabilities of Windows and Linux OSs
4	1	Understand the techniques to hack web servers and tools for it.

Specific outcomes:

MODULE – I: Vulnerabilities and attacks

1.1 Understand ethical hacking concepts
- 1.1.1 Explain the definition of ethical hacking
- 1.1.2 List any five malicious software
- 1.1.3 Explain any five malicious software
- 1.1.4 Explain how to protect against malware attacks
- 1.1.5 List any six network and system attacks
- 1.1.6 Explain any six network and system attacks

MODULE – II: Hacking Techniques

2.1Understand the hacking techniques and tools
- 2.1.1 Describe how web tools are used for footprinting
- 2.1.2 Explain competitive intelligence
- 2.1.3 Describe the use of other footprinting tools
- 2.1.4 Explain the method of DNS zone transfer
- 2.1.5 Explain the art of shoulder surfing
- 2.1.6 Explain the art of dumpster diving

2.1.7 Explain the art of piggy backing
2.1.8 Describe various types of port scans
2.1.9 Explain the use of port scanning tools such as Nmap, Unicornscan, Nessus and OpenVAS
2.1.10 Explain how to conduct ping sweeps
2.1.11 Describe about crafting IP packets

MODULE – III: Operating System Vulnerabilities

3.1 Understand various vulnerabilities of Windows and Linux
3.1.1 Explain Windows file system
3.1.2 Explain Windows RPC
3.1.3 Explain NetBIOS
3.1.4 Explain Server Message Block
3.1.5 Explain common Internet File System
3.1.6 Explain null sessions
3.1.7 Explain Web Services
3.1.8 Explain Buffer overflows
3.1.9 Explain Windows passwords and authentication
3.1.10 Explain the tools for identifying Windows vulnerabilities
3.1.11 Explain the best practices for hardening Windows systems
3.1.12 Explain Linux OS vulnerabilities
3.1.13 Explain the tools for identifying Linux vulnerabilities
3.1.14 Explain the countermeasures against Linux attacks

MODULE – IV: Hacking Web Servers and Wireless Networks

4.1Understand the techniques to hack web servers and tools for it.
4.1.1 Explain web server hacking
4.1.2 Explain about web applications and their components
4.1.3 Describe web application vulnerabilities and countermeasures
4.1.4 Identify the tools used by web attackers and hackers
4.1.5 Explain wireless hacking
4.1.6 Describe the components of a wireless network
4.1.7 Explain the working of wardriving
4.1.8 Explain the tools for wireless hacking
4.1.9 Explain the countermeasures against wireless attacks

CONTENT DETAILS:

MODULE – I: Vulnerabilities and attacks

Definition of ethical hacking, Malicious software – Viruses, Worms, Trojans programs, Spyware, Adware, protection methods, Network and system attacks - Denial of Service (DoS), Distributed Denial of Service (DDoS), Buffer overflow, Ping of death, Session Hijacking, Brute force attack, Man-in-the-middle, Dictionary attack, Replay attack

MODULE – II: Hacking Techniques

Footprinting - Web tools are used for footprinting, Competitive intelligence, Other footprinting tools, DNS zone transfer - Social engineering - Shoulder surfing, Dumpster diving, Piggy backing - Port scanning - Types of port scans, Port scanning tools - Nmap, Unicornscan, Nessus and OpenVAS - Ping sweeps - Crafting IP packets

MODULE – III: Operating System Vulnerabilities

Windows OS vulnerabilities - Windows file system, Windows RPC, NetBIOS, Server Message Block, common Internet File System, Null sessions, Web Services, Buffer overflows, Windows passwords and authentication, Tools for identifying Windows vulnerabilities, Hardening Windows systems

Linux OS vulnerabilities - Tools for identifying Linux vulnerabilities, Countermeasures against Linux attacks

MODULE – IV: Hacking Web Servers and Wireless Networks

Web server hacking - Web applications and their components - Web application vulnerabilities and countermeasures - Tools for web attackers and hackers

Wireless hacking - Wireless network technology - Components of a wireless network – Wardriving - Tools for wireless hacking - Countermeasures against wireless attacks

TEXT BOOK:

1.Hands-On Ethical Hacking and Network Defence - Simpson Michael, Backman Kent ,Corley James-2010

REFERENCES:

1. Official Certified Ethical Hacker Review Guide - DeFino Steven, Kaufman Barry, Valenteen Nick-Cengage Learning--2009

Engebret-sonyngress

COURSE TITLE : CLOUD COMPUTING
COURSE CODE : 5134
COURSE CATEGORY : ELECTIVE
PERIODS/WEEK : 4
PERIODS/SEMESTER : 52
CREDITS : 4

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	UNDERSTANDING CLOUD COMPUTING	**13**
2	CLOUD SERVICES FOR COLLABORATION	**13**
3	USAGE OF CLOUD SERVICES	**13**
4	ONLINE COLLABORATION METHODS	**13**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	**1**	To Understand Cloud Computing concepts
	2	To Understand Cloud Services
2	**1**	To Explore various Cloud Services for Collaboration
3	**1**	To Explore different Cloud Services
4	1	To Explore different ways to Collaborate online

Specific Outcomes

Module I Cloud Computing concepts

1.1 To Understand Cloud Computing concepts
- 1.1.1 Define Cloud Computing
- 1.1.2 To discuss History of Cloud Computing
- 1.1.3 To Describe Cloud Architecture
- 1.1.3 To Discuss Cloud Storage
- 1.1.4 To Discuss need of Cloud Computing
- 1.1.5 Compare Advantages & Disadvantages of Cloud Computing
- 1.1.6 To List Cloud Services

1.2 To Understand Cloud Services
- 1.2.1 To Discuss Web-Based Application
- 1.2.2 To discuss Pros and Cons of Cloud Service Development
- 1.2.3 To discuss Types of Cloud Service Development
- 1.2.4 To discuss Software as a Service
- 1.2.5 To discuss Platform as a Service
- 1.2.6 To discuss Web Services
- 1.2.7 To discuss On-Demand Computing

1.2.8 To discuss Discovering Cloud Services Development Services and Tools
1.2.9 To know Amazon EC2, Google App Engine, IBM Smart Clouds

Module II Cloud Services for Collaboration

2.1 To Explore various Cloud Services for Collaboration
- 2.1.1 To discuss Centralizing Email Communications
- 2.1.2 To discuss Collaborating on Schedules
- 2.1.3 To discuss Collaborating on To-Do Lists
- 2.1.4 To discuss Collaborating Contact Lists
- 2.1.5 To discuss Cloud Computing for the Community
- 2.1.6 To discuss Collaborating on Group Projects and Events
- 2.1.7 To discuss Cloud Computing for the Corporation

Module III Cloud Services

3.1 To Explore different Cloud Services
- 3.1.1 To discuss Collaborate on Calendars , Schedules and Task Management
- 3.1.2 To Explore Online Scheduling Applications
- 3.1.3 To Explore Online Planning and Task Management
- 3.1.4 To discuss Collaborating on Event Management
- 3.1.5 To discuss Collaborating on Contact Management
- 3.1.6 To discuss Collaborating on Project Management
- 3.1.7 To discuss Collaborating on Word Processing
- 3.1.8 To discuss Collaborating on Databases Storing and Sharing Files

Module IV Online Collaboration Methods

4.1 To Explore different ways to Collaborate online
- 4.1.1 To discuss Collaborating via Web-Based Communication Tools
- 4.1.2 To discuss Web Mail Services
- 4.1.3 To discuss Web Conference Tools
- 4.1.4 To discuss Collaborating via Social Networks and Groupware
- 4.1.5 To discuss Collaborating via Blogs and Wikis

CONTENT DETAILS

Module I UNDERSTANDING CLOUD COMPUTING

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services

DEVELOPING CLOUD SERVICES

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing –

Discovering Cloud Services Development Services and Tools – Amazon EC2 – Google App Engine – IBM Smart Clouds

Module II CLOUD SERVICES FOR COLLABORATION

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation

Module III USAGE OF CLOUD SERVICES

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Databases – Storing and Sharing Files

Module IV ONLINE COLLABORATION METHODS

Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – valuating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis

TEXT BOOK(S)

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

REFERENCES:

1. Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for On demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008
2. Cloud computing a practical approach Anthony T.Velte Toby J. Velte Robert Elsenpeter-TATA McGraw-2010

COURSE TITLE : WEB PROGRAMMING LAB
COURSE CODE : 5139
COURSE CATEGORY : A
PERIODS/WEEK : 4
PERIODS/SEMESTER : 52
CREDITS : 2

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Internet Fundamentals and HTML, CSS	13
2	JAVASCRIPT	13
3	Server Side Scripting – PHP	13
4	Database Handling, Content Management System	13
	TOTAL	**52**

General Outcomes :

- To understand Internet, tools used in Internet etc
- To understand web page design tools like HTML, CSS
- To know client side scripting language
- To know Server side scripting and database connectivity
- To Understand Web site development using Content Management System

Specific Outcomes:

Cycle 1

1.1. Practice Internet applications
1.2. Explore Web browsers , search engines
1.3. Familiarise with web portals, e-commerce sites, blogs etc
1.4. Develop simple HTML pages using Basic HTML Markup, HTML lists, Links and images, Data Table, frames
1.5. Develop web pages with user interface using CSS

Cycle 2

2.1. Develop web pages with Forms and its controls
2.2. Implement functions with JavaScript
2.3. Implement Event Handling using JavaScript
2.4. Implement form validation using JavaScript

Cycle 3

3.1 Familiarise LAMP environment
3.2 Design and develop simple php applications
3.3 Illustrate Form Data Retrieval using PHP
3.4 Implement session & cookie management using PHP
3.5 Demonstrate how to send a mail, generate PDF in a PHP page

Cycle 4

4.1 Illustrate database and table creation using web based database administration tools
4.2 Develop web pages for data handling using PHP (Insert, Delete and Update)
4.3 Develop reports (pdf & html data table) using data from database in PHP
4.4 Familiarize content Management System Joomla
4.5 Design and develop CMS supported web application using Joomla

COURSE TITLE	**:**	**MICROPROCESSOR LAB**
COURSE CODE	**:**	**5138**
COURSE CATEGORY	**:**	**A**
PERIODS/WEEK	**:**	**4**
PERIODS/SEMESTER	**:**	**52**
CREDITS	**:**	**2**

General Outcomes :

Sl.	G.O	Student will be able
1	1	To understand the Programming environment of 8086
2	1	To understand The Instruction set and Programming Concepts of x86 Processor- Data transfer Instructions- Branch instructions- Arithmetic instructions
3	1	To understand The Instruction set and Programming Concepts of x86 Processor- Shift and Rotate Instructions- String Instructions
4	1	To understand The Instruction set and Programming Concepts of x86 Processor- Procedures, Macros and Number Format Conversions

Specific Outcomes:

Module I

1.0 To understand the Programming environment of 8086

1.1 Explore the Assembler, its different directives, and its different system interrupts

Module II

2.0 To understand The Instruction set and Programming Concepts of x86 Processor

2.1 Write small programs to implement the instructions and their usage in programs (Data transfer Instructions- Branch instructions- Arithmetic instructions)

Module III

3.1 To understand The Instruction set and Programming Concepts of x86 Processor

3.1 Write small programs to implement the instructions and their usage in programs (Shift and Rotate Instructions- String Instructions)

Module IV

4.1 To understand The Instruction set and Programming Concepts of x86 Processor

4.1 Rewrite the programs done above to implement the ideas of Procedures, Macros and Number Format Conversions

Hardware Requirement : 8086 Trainer Kit

Software Requirement: Assembler

COURSE TITLE : INDUSTRIAL TRAINING/ INDUSTRIAL VISIT / COLLABORATIVE WORK /SPOKEN TUTORIAL
COURSE CODE : 5009
COURSE CATEGORY : P
DAYS / SEMESTER : 14
CREDITS : 2

General Outcome:

GO	On completion of the study of this course the students will be able:
1	To provide an industrial exposure in tune with the curriculum.
2	To familiarize industrial standards, safety aspects, organizational structure.
3	To improve employability of students.
4	To provide training on industrial relevant topics.

Guidelines:

The students need to undergo any of the four options mentioned in the course title for successful award of credit for the program, subject to the evaluation criteria mentioned below.

Industrial Training:

The students need to undergo 10 days full time industrial training on Government, Quasi Government or Public limited industries. Students of Diploma in Biomedical Engineering can opt for Super/multi specialty hospitals in addition to the above mentioned industries. On successful completion of the training students need to submit certificate of completion mentioning days of their attendance to the Head of the Department. It is required to submit bonafide report of the training at the end of the course and shall be evaluated internally.

Evaluation criteria:

1. Attendance (based on feedback from the industry) : 30%
2. Involvement (based on feedback from the industry) : 30%
3. Viva (as part of internal evaluation at the institute) : 20%
4. Bonafide record : 20%

Industrial Visit:

The concept of industrial visit is to encourage students to interact with nearby industries. The students need to be assigned with specific task that need interaction with the industry. For example, students of Diploma in Chemical Engineering in batches of five can be sent to the nearby industry to collect details regarding effluent treatment. Industrial visit to Small, medium or large scale industries accompanied by faculty members can also be encouraged. In such case one faculty from each branch can be assigned as advisor for the visit. The advisor can identify appropriate industry and co-ordinate the visit. At least four

industries should to be visited for successful completion of the course. The visit can be spanned conveniently within the semester. Evaluation is based on the report submitted by the accompanied faculty along with the evaluation criteria mentioned below. It is required to submit bonafide report of the visit at the end of the course and shall be evaluated internally.

Evaluation criteria:

1. Attendance ((evaluated by the advisor) : 30%
2. Involvement (evaluated by the advisor) : 30%
3. Viva (as part of internal evaluation at the institute) : 20%
4. Bonafide record : 20%

Collaborative Work:

Academic departments can collaborate with industries of repute by way of taking up consultancy, testing or assembling work. One faculty can be assigned as coordinator. The students need to consult or visit the collaborative industry as part of the course. It is required to submit bonafide report at the end of the collaborative work and shall be evaluated internally. It is to be ensured that the collaborating industry is selected based on their repute in the segment. Collaborative works are not allowed with academic or industrial training providers.

Evaluation criteria:

1. Attendance (evaluated by the advisor) : 30%
2. Involvement (evaluated by the advisor) : 30%
3. Viva (as part of internal evaluation at the institute) : 20%
4. Bonafide record : 20%

Spoken Tutorial

Students can optionally go for spoken tutorial provided Ministry of Human Resource Development, Govt. of India for successful completion of the course. Students can go for at least one course provided as part of spoken tutorial. The students need to submit completion certificate with mention of their grade.

Evaluation criteria:
Evaluation shall be made based on certification of the programme.

COURSE TITLE : COMPUTER NETWORK ENGINEERING LAB
COURSE CODE : 5137
COURSE CATEGORY : A
PERIODS/WEEK : 5
PERIODS/SEMESTER : 65
CREDITS : 5

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Installation and Configuration of Network Hardware Components	**17**
2	Installation and Configuration of TCP/IP Protocol	**17**
3	Network Operating System Administration	**17**
4	Network Security Administration	**14**

Course General Outcomes:

Sl.	G.O	Student will be able
1	1	Installation and Configuration of Network Hardware Components
2	1	Installation and Configuration of TCP/IP Protocol
3	1	Network Operating System Administration
4	1	Network Security Administration

Specific Outcomes:

Module I. Installation and Configuration of *Network Hardware* Components

1.Study of Hardware Component used in Networking.
2.Crimping of UTP Cable, Patch Panel Punching, Junction I/O Boxes.
3.Installation of Network Interface Card (NIC).
4.Peer-to-Peer Networking & Working in Peer-to-Peer Environment.
5.Sharing Resources, Accessing Shares and Share Level Security.
6.Troubleshooting (Cable Connectivity, Upgrading NIC Driver,Software).

Module II. Installation and Configuration of TCP/IP Protocol

1.Installation of Wireless Devices -LAN Card, Router, Access Point.
2.Identifying valid IP Addresses, Defining Subnet Ids and Host Ids.
3.Using TCP/IP Utilities& Commands (PING, IPCONFIG, HOSTNAME, ROUTE, TRACERT, ARP, FTP, Telnet).
4.Study of TCP/IP

Module III. Network Operating System Administration

1. Installation of Operating Systems.
2. Configuring Hardware Profile.
3. Creating Users and Groups and setting their properties.
4. Configuring Roaming and Mandatory User Profiles.
5. Creating and Managing Shares.
6. Study of AGP Process.
7. Study of Permissions.
8. Study of Encrypted File System.
9. Study of File Compression.
10. Study of Event Viewer, Task Manager.
11. Study of System Monitor & Performance Log.
12. Installing Local and Network Printer and set priority.
13. Installation of Server

Module IV. Network Security Administration

1. Study of Disk Management & Implementing Disk Quotas.
2. Study of Backup, Restore and Automated System Recovery.
3. Installing and Configuring Terminal Services & RDP.

COURSE TITLE : PROJECT WORK AND SEMINAR
COURSE CODE : 6009
COURSE CATEGORY : A
PERIODS / WEEK : 6
CREDITS : 10

PART 1 - SEMINAR

General outcome:

GO	On completion of this course the students will be able:
1	To get an exposure to innovations in Technology/Information.
2	To develop presentation skills.
3	To develop creative interaction among listeners.
4	To appreciate peers and to give feedback.

Guidelines:

1. Seminar presentation shall be of individual nature rather than group work and shall be coordinated by a guide allotted among the faculty members.

2. Topics shall be constrained to those related to Technology and allied area, but not part of the curriculum.

3. The guide shall provide necessary guidance as to arrive on to the final topic from the area of student's interest and based on the relevance.

4. The topic selected shall help students in acquiring necessary technical knowledge so as to help them in performing better in job interviews or to help them in developing entrepreneurship skills.

5. Presentation shall be for 15 minutes at the minimum.

6. Audio visual aids shall be utilized. Students shall be encouraged to use open source documentation tools like Latex for preparing presentation, posters and seminar reports.

7. Synopsis of the seminar should be submitted at least 3 working days before presentation.

8. Bonafide report containing abstract, content and the reference should be submitted for final evaluation.

9. Seminar evaluation for both continuous assessment and external examination shall be performed in such a way that seminar accounts for 2/10 weightage in terms of total credit for Project work and Seminar.

Seminar evaluation (1/ 5th of total weightage for the course)				
Topic selection (20%)	Presentation (30%)	Interaction (20%)	Slides and presentation aids (15%)	Report (15%)

PART 2 – PROJECT WORK

General outcome

GO	On completion of this course the students will be able:
1	To utilize theoretical and practical knowledge acquired for developing an industry standard product or prototype.
2	To learn financial planning.
3	To enhance team spirit and creative talents for achieving goal.
4	To promote entrepreneurship.
5	To serve industry or community by way of technology transfer.

Guide lines

1. Project selection shall be based on social and technological relevance.

2. Preference shall be given to topics that uphold service to community by way of providing direct technology transfer to society.

   To elaborate the point, technologies such as those provide low cost housing to the society, mechanizing agricultural sector, developing tools that aid in productivity in traditional employment sector are be few examples that may be considered while selecting the topic for Project work. The whole idea is that project work should be utilized as an effective tool as for the community or industry to walk into institutions for materializing innovative ideas irrespective of the sector. In such cases inter disciplinary project works shall also be encouraged.

3. The selected topic should uphold entrepreneurship values. Collaboration with Startup villages or incubation centers shall be used for effective implementation of ideas.

4. Each project team can have a maximum of five members. But in case of projects that demand more human resources, responsibilities can be suitably divided among different team.

5. Every project team shall be allotted with a project guide among faculty members. The project guide shall provide all necessary guidance and maintain a detailed record of individual students involvement in the work and do continuous assessment of the project. Project work holds 8/10 weightage of the total credit.

6. Evaluation shall be done on weekly, monthly and end semester basis.

7. Out sourcing of academic projects are not allowed. If the projects are found to be outsourced, credits shall be forfeited at any point of time.

8. Teaming up with startup village, business incubation centers are highly appreciated.

9. It is required to submit bonafide report of the project for final evaluation.

Project work evaluation (4/ 5^{th} of total weightage for the course)						
Topic selection (20%)	Innovation (10%)	Selection of Tools (20%)	Interface to community/ Industry (10%)	Quality of Work (20%)	Safety aspects (10%)	Report (10%)

Diploma in Computer Engineering
Revision 2015
Syllabus
Semester - VI

semester VI										
S. No	Code	Course	Course Category	Periods per week			Credits	Type	Evaluation	
				Theory	Practical	Total			CA	External
1	6132	Microcontrollers	A	5	0	5	5	T	50	100
2	6131	Computer Networks	A	4	0	4	4	T	50	100
3	6133	Smart Device Programming	A	5	0	5	5	T	50	100
4	6134	Mobile Communication	E	5	0	5	5	T	50	100
	6135	Network Infrastructure Mangagement	E	5	0	5	5	T	50	100
	6136	Software Testing	E	5	0	5	5	T	50	100
5	6139	Microcontroller Lab	A	0	5	5	3	P	50	50
6	6138	Smart Device Programming Lab	A	0	5	5	3	P	50	50
7	6009	Project & Seminar	A	0	6	6	10	Pr	50	50
				19	16	35	35			

COURSE TITLE	**:**	**MICROCONTROLLERS**
COURSE CODE	**:**	**6132**
COURSE CATEGORY	**:**	**A**
PERIODS/WEEK	**:**	**5**
PERIODS/SEMESTER	**:**	**75**
CREDITS	**:**	**5**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	AVR Microcontrollers & Assembly Language Programming	**18**
2	AVR Programming in C	**18**
3	Timer, Interrupt, Programming	**19**
4	Interfacing sub systems with AVR	**20**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	To understand AVR Microcontrollers and its Architecture
	2	To know AVR Assembly Language Programming
	3	To apply Assembly Language Instructions in AVR
2	1	To understand I/O Port Programming
	2	To understand AVR Programming in C
3	1	To understand Timer and Interrupt Programming
4	1	To understand the interfacing of various systems with AVR microcontroller

Specific Outcomes:

MODULE –I AVR Microcontrollers & Assembly Language Programming

1.1 To understand AVR Microcontrollers and its Architecture

1.1.1 To explain the basics of Microcontrollers
1.1.2 To Compare and contrast Microcontrollers and Microprocessors
1.1.3 To describe AVR family of Microcontrollers
1.1.4 To list the AVR features
1.1.5 To explain AVR Architecture with block diagram

1.2 To comprehend AVR Assembly Language Programming

1.2.1 To state the usage of instructions in Data Memory
1.2.2 To write AVR data formats
1.2.3 To explain the Program counter and Program ROM space
1.2.4 To explain the RISC and Harvard architecture in AVR

1.3 To apply Assembly Language Instructions in AVR

1.3.1 To Explain Branch instructions and looping
1.3.2 To Explain Call instructions and stack
1.3.3 To explain Time Delay Loop

MODULE – II AVR Programming in C

2.1 To Describe I/O Port programming

2.1.1 To explain I/O port programming in AVR

2.1.2 To explain I/O bit Manipulation Programming .

2.2 To understand AVR Programming in C

2.2.1 To list Data types in C

2.2.2 To explain Time Delays in C

2.2.3 To discuss I/O programming in C

2.2.4 To explain Logic Operations in C

MODULE – III Interfacing sub systems with AVR

3.1 To understand Timer and Interrupt Programming in C

3.1.1 To describe Timers 0,1, and 2 programming

3.1.2 To explain Counter Programming

3.1.3 To explain AVR interrupts

3.1.4 To illustrate Timer interrupts

MODULE –IV Interfacing sub systems with AVR

4.1 To understand the interfacing of various systems with AVR microcontroller

4.1.1 To explain AVR serial port programming

4.1.2 To Illustrate LCD interfacing

4.1.3 To Illustrate Keyboard interfacing

4.1.4 To Illustrate ADC interfacing

4.1.5 To Illustrate DAC interfacing

4.1.6 To Illustrate Sensor interfacing

CONTENT DETAILS

MODULE –I AVR Microcontrollers & Assembly Language Programming

Basics of Microcontrollers - Compare and contrast Microcontrollers and Microprocessors –Overview of AVR family of Microcontrollers - AVR features - AVR Architecture with block diagram – The general Purpose Registers in the AVR

AVR Data Memory-Using instructions with the Data Memory – AVR status Register - AVR data formats - Program counter and Program ROM space- RISC and Harvard architecture in AVR

Branch instructions and Looping- Unconditional branch instruction - Call instructions and stack – AVR Time delay and Instruction pipeline

MODULE – II AVR Programming in C

I/O port programming in AVR – I/O bit Manipulation Programming.

Data types and Time Delays in C - I/O programming in C –

Logic Operations in C- Data Conversion Prpograms in C – Data Serialization in C

MODULE – III Timer, Interrupt, Programming

Programming Timers 0, 1, and 2 - Counter Programming - AVR interrupts – Programming Timer Interrupts –Programming External Hardware interrupts – Interrupt priority in the AVR -

MODULE –IV Interfacing sub systems with AVR

Basics of Serial Communication – ATMEGA32 connection to RS232 - AVR serial port programming in C- LCD interfacing - Keyboard interfacing - ADC interfacing -- DAC interfacing - Sensor interfacing

Note: Assembly Language Programming is not necessary from Module II onwards.

TEXT BOOK:

1. The AVR Microcontroller and Embedded Systems Using Assembly and C By Muhammad Ali Mazidi, Sarmad Naimi, & Sepehr Naimi - Pearson Education

REFERENCES:

1. Introduction to Embedded Systems - Shibu K.V, Mc Graw Hill.First Edition
2. Embedded C - Michael J. Pont, Pearson Education, Second Edition
3. Embedded Systems - Raj Kamal, , Mc Graw Hill, Second Edition

WEB SITE:

http://freevideolectures.com

COURSE TITLE : COMPUTER NETWORKS
COURSE CODE : 6131
COURSE CATEGORY : A
PERIODS/WEEK : 4
PERIODS/SEMESTER : 60
CREDITS : 5

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Review of Network Models	**15**
2	Network Layer	**15**
3	Transport Layer	**15**
4	Application Layer	**15**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	**1**	To Understand the concept of TCP/IP Protocol
2	**1**	To Understand the concept of Network Layer
3	**1**	To Understand the concept of Transport Layer
4	1	To Understand the concept of Application Layer

Specific Outcomes:

MODULE I. REVIEW OF NETWORK MODELS

1.1 Understand TCP/IP Protocol

- 1.1.1 Illustrate computer networks
- 1.1.2 Identify TCP/IP Protocol suite.
- 1.1.3 Explain the functionalities of layers in TCP/IP
- 1.1.4 Define Addressing of TCP/IP.
- 1.1.5 Describe about Wired LAN – Ethernet
- 1.1.6 State IEEE 802 project
- 1.1.7 Illustrate standard Ethernet
- 1.1.8 Describe about Wireless LAN.
- 1.1.9 State IEEE 802.11
- 1.1.10 Explain LAN connecting devices.
- 1.1.11 Explain the architecture of Virtual LANs.

MODULE II NETWORK LAYER

2.1 Understand Network Layer

- 2.1.1 Explain Network layer services
- 2.1.2 Illustrate network layer performance
- 2.1.3 Describe IPV4 addresses

2.1.4 Define DHCP
2.1.5 Explain Internet Protocol
2.1.6 State security of IPV4 datagram
2.1.7 Describe routing algorithms
2.1.8 Differentiate between unicasting, multicasting, and broadcasting

MODULE III TRANSPORT LAYER

3.1 Understand Transport Layer
3.1.1 Explain Transport layer services
3.1.2 Explain Transport layer protocols
3.1.3 Explain User Datagram Protocol (UDP).
3.1.4 Explain Transmission Control Protocol (TCP).
3.1.5 Describe Stream Control Transmission Protocol (SCTP).

MODULE IV APPLICATION LAYER

4.1 Understand Application Layer
4.1.1 Explain various services of application layer
4.1.2 Illustrate World Wide Web
4.1.3 Describe HTTP
4.1.4 Explain File Transfer Protocol.
4.1.5 Explain Electronic Mail
4.1.6 Explain TELNET.
4.1.7 Describe Domain Name System.
4.1.8 Define Dynamic DNS

CONTENT DETAILS

MODULE I – TCP/IP PROTOCOL

Introduction to computer networks – physical structure, topology, types - TCP/IP – architecture, Description of layers, addressing – wired LAN – Ethernet protocol – IEEE project 802 – Standard Ethernet – characteristics, addressing, implementation – wireless LAN – architectural comparison, characteristics, access control – IEEE 802.11 – architecture – LAN connecting devices – hub, switch, router – virtual LAN – architecture, membership, configuration

MODULE II – NETWORK LAYER

Network layer services – Packetizing, routing and forwarding, other services – Performance – delay, throughput, packet loss, congestion control – IPV4 address – address space, classful addressing, classless addressing, subneting – DHCP – Internet protocol (IP) – datagram format, fragmentation – IPV4 datagram security – Routing algorithms – Distance-vector, Link-state, path vector – unicasting, multicasting, broadcasting

MODULE III – TRANSPORT LAYER

Transport layer services - process-to-process communication, encapsulation and decapsulation, pushing, flow control, error control, congestion control, connectionless and connection oriented protocols – Transport layer protocols – simple, stop and wait, go back-N, Selective repeat, piggy backing - UDP – user datagram, services, applications – TCP – services, features, segment, connection – SCTP – services, features

MODULE IV – APPLICATION LAYER

Application layer services - WWW – architecture, URL – HTTP – connections, message formats - FTP – control connections, data connections - Electronic mail – architecture, sending, receiving mails, SMTP, transfer phases, POP and IMAP - TELNET – DNS – name space, DNS in internet, resolution, resource records, DNS messages – Dynamic DNS

TEXT BOOK(S):

1. Data Communications and Networking – Behrouz A. Forouzan – McGraw Hill Edn.-Fourth Edition/Fifth Edition

REFERENCES:

1. Computer Networks – Andrew S. Tanenbaum – Prentice Hall-Fifth Edition
2. Data Communication & Networks - William Stalling- Prentice Hall-Tenth Edition
3. Data Communications, Computer Networks and Open Systems –Fred Halsall , Addison-Wesley, 1996

COURSE TITLE	**:**	**SMART DEVICE PROGRAMMING**
COURSE CODE	**:**	**6133**
COURSE CATEGORY	**:**	**A**
PERIODS/WEEK	**:**	**5**
PERIODS/SEMESTER	**:**	**75**
CREDITS	**:**	**4**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Android and Development Environments	**20**
2	Simple Android Application Development	**19**
3	UI Design and Data storage	**18**
4	HTML 5.0 and JavaScript	**18**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	Describe Different mobile technologies
2	1	Develop Simple Android application
3	1	Describe android UI designing and Data Storage
	2	Applications with Data Storage and retrieval
	3	Develop applications and publish
4	1	Develop applications using HTML 5 and JavaScript

Specific Outcomes:

Module 1 Android and Development Environments

1.1 To Understand Different mobile technologies

1.1.1 To List various mobile technologies

1.1.2 To Compare Apple IOS and Android

1.1.3 To describe how Eclipse, Android Studio and Android sdk is installed

1.1.4 To describe how Android virtual device is created

1.1.5 To explain how a “Hello World” program is developed and run.

1.1.6 To List features of Eclipse and Android Studio for professional software Development

Module 2 Simple Android Application Development

2.1 To Understand Simple Android application Development

2.1.1 To explain how Android Virtual device operates

2.1.2. To describe activity in android

2.1.3. To explain how activities can be linked using intent

2.1.4. To describe how data can be passed between activities

2.1.5. To List various android basic components

Module 3 UI Design and Data storage

3.1. To Understand android UI designing

3.1.1. List different layout systems.

3.1.2. List basic and popular components in android UI

3.1.3. Describe how data storage is done in Android

3.2 To Understand Data Storage

3.2.1. List various storage technologies

3.2.2. Explain how SQLite database and operations are used for data storage and retrieve

3.2.3. Understand various content Providers and their relative advantages and disadvantages3.3 To develop applications and publish

3.3.1. Explain how SMS service is provided in Android

3.3.2. Describe how to publish the developed application in Google Play Store

Module 4 Mobile Application development using HTML 5.0 and JavaScript

4.1 To develop applications using HTML 5 and JavaScript

4.1.1. Describe how HTML 5 is used for mobile application development

4.1.2. Describe how JavaScript is used for mobile application development

4.1.3. List HTML 5 tags and attributes for mobile development

4.1.4. Describe advantages and uses of PhoneGap

4.1.5. Build Applications with camera, geolocation, Media Files, Storage options

CONTENT DETAILS

Module1. Introduction to Android and Development Environments

Various mobile technologies- Apple IOS – Android operating system- install and configure Eclipse, Android Studio andn Android sdk - android virtual device- creation of android virtual device- sample programs – features of Eclipse and Android studio.

Module 2. Simple Android Application Development

Sample programs- Operation of Android Virtual device - activity in android –Life cycle of an activity intent – linking activities using intent- data passing between activities using intent - android components: activities, services, broadcast receivers, content providers.

Module 3. UI Design and Data storage

UI components: -Layout: Linear, Absolute, Table, Frame. - Views: Text, Edit, Button, ImageButton, CheckBox, ToggleButton, RadioButton, RadioGroup, List, Image, Grid . Menus – Options, Context- Action bar, Notifications- data storage in Android- various storage technologies- operations for data storage and retrieval to/from internal and external memory - SQLite database- - content Providers and their relative advantages and disadvantages - SMS service in Android - publish application in Google Play Store.

Module 4 . Mobile Application development using HTML 5.0 and JavaScript

HTML components for mobile applications-HTML 5 tags and attributes for mobile development- Styling Mobile Pages with CSS3 - Simple applications using HTML5 and JavaScript- Building a mobile web application - Introduction to PhoneGap.

TEXT BOOK(S):

1. **Beginning Android Application Development- Wei-Meng Lee- Wrox-First Edition.**
2. **HTML 5 Mobile Application Development- SAMS publications- Jennifer KyrninJennifer Kyrnin.-First Edition**

REFERENCE:

Beginning PhoneGap – Thomas Myer-2011

COURSE TITLE : MOBILE COMMUNICATION
COURSE CODE : 6134
COURSE CATEGORY : E/A
PERIODS/WEEK : 5
PERIODS/SEMESTER : 75
CREDITS : 5

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Cellular Wireless Networks	**18**
2	Wireless Networking	**18**
3	Wireless LAN Technology	**19**
4	Bluetooth and IEEE 802.15	**20**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	**1**	Understand Cellular Wireless Systems
	2	Understand Multiple Access in Wireless Networks
2	**1**	Understand satellite communication
	2	Study wireless systems operations and standards
	3	Understand Mobile IP and WAP
3	**1**	Understand Wireless LAN Technology
	2	Understand Wi-Fi and IEEE 802.11 standard
4	1	Understand Bluetooth Technology
	2	Understand IEEE 802.15 protocol

Specific Outcomes:

MODULE – I: Cellular Wireless Networks

1.1 To understand Cellular Wireless Networks
- 1.1.1. Discuss Frequency reuse, Increasing capacity, operation, Handoff in Cellular Networks.
- 1.1.2. Describe first generation analog cellular networks
- 1.1.3. Explain second generation cellular systems TDMA
- 1.1.4. Describe Second Generation CDMA Cellular Systems
- 1.1.5. Discuss Third Generation (3G) Cellular Systems
- 1.1.6. Explain CDMA Design considerations

1.2 To understand Multiple Access in Wireless Networks
- 1.2.1 Describe Frequency Division Multiple Access
- 1.2.2 Describe Time Division Multiple Access

1.2.3 Describe Code division multiple access
1.2.4 Describe space division multiple access
1.2.5 Describe Packet Radio access
1.2.6 Describe multiple access with collision avoidance

MODULE – II: Wireless Networking

2.1 To understand Satellite Communication
- 2.1.1 Describe satellite parameters
- 2.1.2 Describe satellite configurations
- 2.1.3 Explain capacity allocation frequency division
- 2.1.4 Explain capacity allocation time division

2.2 To Study Wireless System Operations and Standards
- 2.2.1 Explain cordless systems
- 2.2.2 Describe Wireless Local Loop
- 2.2.3 Explain IEEE 802.16 Broadband wireless access standards

2.3 To Understand Mobile IP and WAP
- 2.3.1 Explain operation of Mobile-IP
- 2.3.2 Explain the architectural overview of Wireless Application Protocol

Module III: Wireless LAN Technology

3.1 To Understand Wireless LAN Technology
- 3.1.1 Distinguish Single cell and multiple cell wireless LAN configurations
- 3.1.2 Discuss requirements of wireless LAN
- 3.1.3 Describe Infrared LAN
- 3.1.4 Describe Spread Spectrum LAN
- 3.1.5 Describe Narrowband Microwave LAN

3.2 To Understand Wi-Fi and IEEE 802.11 standard
- 3.2.1 Describe IEEE 802 Architecture
- 3.2.2 Explain IEEE 802.11 Architecture and services
- 3.2.3 Explain IEEE 802.11 Medium Access Control
- 3.2.4 Explain IEEE 802.11 Physical Layers
- 3.2.5 Describe Wi-Fi Protected Access

Module IV: Bluetooth and IEEE 802.15

4.1 To Understand Bluetooth Technology
- 4.1.1 Discuss blue tooth applications and architecture
- 4.1.2 Explain Scatternet and Piconet

4.2 To study about IEEE 802.15 protocol
- 4.2.1 Discuss IEEE 802.15 architecture for Wireless Personal Area Networks
- 4.2.2 Explain IEEE 802.15.3 protocol for WPAN
- 4.2.3 Describe Bluetooth low energy.
- 4.2.4 Discuss Wireless Sensor Network

CONTENT DETAILS

Module I Cellular Wireless Networks

Cellular Wireless Networks -Frequency reuse - Increasing capacity – operation – Handoff- First generation analog cellular networks - Second generation cellular systems TDMA - Second Generation CDMA Cellular Systems - Third Generation (3G) Cellular Systems - CDMA Design considerations.

Multiple Accesses in Wireless Networks - Frequency Division Multiple Access (FDMA) - Time Division Multiple Access (TDMA) - Code Division Multiple Access (CDMA) - Space Division Multiple Access - Packet Radio Access - Multiple accesses with collision avoidance

Module II Wireless Networking

Wireless Networking - Satellite Communication - satellite parameters - Satellite configurations - Capacity allocation frequency division - Capacity allocation time division

Wireless System Operations and Standards - cordless systems - Wireless Local Loop - IEEE 802.16 Broadband wireless access standards

Mobile IP and WAP - Operation of Mobile-IP - Architectural overview of Wireless Application Protocol

Module III Wireless LAN Technology

Wireless LAN Technology - Single cell Configuration - multiple cell configurations - Requirements - Infrared LAN - Describe Spread Spectrum LAN - Narrowband Microwave LAN

Wi-Fi and IEEE 802.11 standard - IEEE 802 Architecture - IEEE 802.11 Architecture and services - 802.11 Medium Access Control - IEEE 802.11 Physical Layers - Describe Wi-Fi Protected Access

Module IV Bluetooth and IEEE 802.15

Bluetooth Technology - Bluetooth applications - architecture – scatternet-piconet-**IEEE 802.15 protocol - A**rchitecture of WPAN - IEEE 802.15.3 protocol for WPAN-Bluetooth low energy-Wireless Sensor Network.

TEXT BOOK(S):

1. Wireless Communications & Networks : Author: William Stallings - Pearson –Second Edition

REFERENCE:

1. Wireless and Mobile Networks: Concepts and Protocols : Author: Dr.Sunilkumar S. Manvi & Mahabaleshwar -: Wiley – India-2010
2. Undamentals Of Wireless Communication Tse Cambridge University Press First Edtion

COURSE TITLE	**:**	**NETWORK INFRASTRUCTURE MANAGEMENT**
COURSE CODE	**:**	**6135**
COURSE CATEGORY	**:**	**E/A**
PERIODS/WEEK	**:**	**5**
PERIODS/SEMESTER	**:**	**75**
CREDITS	**:**	**5**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	**Networking Control Devices**	**18**
2	**IP addressing, Access Control**	**18**
3	**Basics of Router Configuration**	**19**
4	**IP Routing Protocols**	**20**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	Understand the present networking scenario
	2	Understand the commonly used networking devices
	3	Understand cable categories, connection tools, and cable structures
2	1	Understand IP addressing- IPV4 and IPV6
	2	Understand Domain and work group users
	3	Understand Securing files and folders
3	1	Basics of Router Configuration
4	1	Understand TCP/IP Dynamic Routing Protocols
	2	Understand Configuring IP Routing Protocols
	3	Understand Network Troubleshooting, Performance Tuning

Specific Outcomes:

Module I - Networking Control Devices

1.1 Understand the present networking scenario.
- 1.1.1 Explain current networking scenario.
- 1.1.2 Describe Network Infrastructure Management

1.2 Understand the commonly used networking devices
- 1.2.1 Explain about Switch, Hub and Router
- 1.2.2 Explain Repeaters, VPN devices and Modem
- 1.2.3 Discuss about wireless network devices (wi-fi, Bluetooth, wi-max)

1.3 Understand cable categories, connection tools, and cable structures
- 1.3.1 Describe Bounded media–Twisted Pair (straight through, Cross-Over, Roll-Over)
- 1.3.2 Explain Co-axial Cable
- 1.3.2 Explain unbounded media - Fiber Optics media

Module II - IP addressing, Access Control and User Permission Settings

2.1 Understand IP addressing- IPV4 and IPV6
- 2.1.1 State Versions of IP addressing
- 2.1.2 Explain the Classes of IP address
  Describe subnet mask
- 2.1.5 Explain the Concept of DNS and DHCP server
- 2.1.5 Explain the working of DNS and DHCP
- 2.1.6 List the Installation requirements of DNS and DHCP

2.2 Understand Domain and work group users
- 2.2.1 Explain Managing users and group accounts
- 2.2.2 Describe how to add group memberships
- 2.2.3 List the steps for creating child domain
- 2.2.4 Explain about domain controllers
- 2.2.5 Explain about Trust relations

2.3 Understand Securing files and folders
- 2.5.1 Describe about set up share permission
- 2.3.2 Explain how to set up security permission
- 2.3.3 Explain remote desktop connections
- 2.3.4 Describe Remote Desktop Assistance
- 2.3.1 Explain windows firewall
- 2.3.2 Explain Encryption techniques
- 2.3.3 Describe IP security
- 2.3.4 Explain system backup
- 2.3.5 Explain active directory backup

Module III Basics of Router Configuration

3.1 . Understand Routers.
- 3.1.1 Describe Router Hardware
- 3.1.2 Explain Memory on Routers
- 3.1.3 Explain 'Talking to Router' (Through the Console).
- 3.1.4 Explain Router IOS
- 3.1.5 Explain Configuring Router with <copy> and TFTP
- 3.1.6 Explain Basic Router Configuration
- 3.1.7 Explain Disaster Recovery
- 3.1.8 Explain about Setting the Bootstrap Behavior
- 3.1.9 Describe Configuration Register Settings
- 3.1.10 Explain upgrading Router's IOS
- 3.1.11 Explain Configuring the Router's Clock
- 3.1.12 Explain IOS Message Logging.

3.1.13 Explain Setting Up Buffered Logging.
3.1.14 Explain Setting Up Trap Logging
3.1.15 Explain IOS Authentication and Accounting.

Module IV Configuration of IP Routing Protocol

4.1 Understand TCP/IP Dynamic Routing Protocols
4.1.1 Describe General Routing Concepts and Terms
4.1.2 Explain TCP/IP Static Routing
4.1.3 Explain TCP/IP Interior Gateway Protocols
4.1.4 Explain TCP/IP Exterior Gateway Protocols

4.2 Understand Configuring IP Routing Protocols
4.2.1 Choose the Right Protocol
4.2.2 Explain Route Selection
4.2.3 Display General Routing Information
4.2.4 Manage Static Routing.
4.2.5 Configure Dynamic IGP and EGP IP Routing Protocols
4.2.6 Explain Route Control and Redistribution

4.3 Understand Network Troubleshooting, Performance Tuning, and Management Fundamentals.
4.3.1 Explain Network Analysis and Performance Tuning
4.3.2 Develop Troubleshooting Skills.
4.3.3 Explain Network Management Fundamentals

CONTENT DETAILS

Module I Networking Control Devices

Familiarization of networking Control DevicesCurrent networking scenario-importance of Network Infrastructure Management-
Commonly used networking devices- Switch, Hub and Router- Repeaters, VPN devices and Modem-wireless network devices (wi-fi, Bluetooth, wi-max).
Cable categories, connection tools, and cable structures Twisted Pair (straight through, Cross-Over, Roll-Over) Co-axial Cable Fiber Optics media

Module II IP addressing, Access Control and User Permission Settings

Domain and work group network architecture:-client server architecture -the Requirements of domain network-Domain controllers and Active directory.
Analyze IP addressing-IPV4 and IPV6:-Versions of IP addressing-Classes of IP address-Understanding subnet mask-Concept of DNS DHCP server -Working of DNS and DHCP-Installation requirement of DNS and DHCP.
Domain and work group users:-Managing user, group accounts-Adding group memberships-Physical and logical components of domain-Understanding child domain-additional domain controller-Trust relation.Securing files and folders:- setting share permission-setting security permission. Remote

Management:- remote desktop connections-Remote Desktop Assistance. Operating system security overview:- windows firewall- Encryption techniques-IP security-system backup- active directory backup.

Module III Basics of Router Configuration

Introduction to Routers. Router Hardware-Memory on Routers- 'Talking to Router' (Through the Console).- Router IOS- Configuring Router with <copy> and TFTP-Basic Router Configuration-Disaster Recovery-Setting the Bootstrap Behavior-Configuration Register Settings-t upgrading Router's IOS-Configuring the Router's Clock-IOS Message Logging.-Setting Up Buffered Logging-Setting Up Trap Logging-IOS Authentication and Accounting.

Module IV IP Routing Protocols

TCP/IP Dynamic Routing Protocols:General Routing Concepts and Terms-TCP/IP Static Routing-TCP/IP Interior Gateway Protocols-t TCP/IP Exterior Gateway Protocols

Configuring IP Routing Protocols on Routers: Choosing the Right Protocol-Route Selection-General Routing Information-Managing Static Routing- Configure ting Dynamic IGP and EGP IP Routing Protocols-Route Control and Redistribution.

Network Troubleshooting, Performance Tuning, and Management Fundamentals: Network Analysis and Performance Tuning-Develop Troubleshooting Skills-Network Management Fundamentals.

TEXT BOOK(S):

1. Understanding the Network A Practical Guide to Internetworking , Michael J. Martin New Riders Publishing

REFERANCE:

1. Richard McMohan Introduction to Networking Tata McGraw Hill
2. Behrouz A. Forouzan – Local Area Networks McGraw Hill Edn.
3. Todd Lammle- CiscoCertified Network Associate 3/E Wiley India Pvt. Ltd/Sybex Jill Spealman, Planning, Implementing, and Maintaining a Windows Server, Microsoft Press

COURSE TITLE : SOFTWARE TESTING
COURSE CODE : 6136
COURSE CATEGORY : ELECTIVE
PERIODS/WEEK : 5
PERIODS/SEMESTER : 75
CREDITS : 5

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Testing methodology	**19**
2	Testing techniques	**19**
3	Test automation and testing tools	**19**
4	Debugging process	**18**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	To understand testing methodology
2	1	To understand Testing techniques
	2	To omprehend various techniques
3	1	To understand test automation and testing tools
4	1	To understand the process of debugging

Specific Outcomes:

MODULE – I: Testing Methodology

1.1 To understand testing methodology
- 1.1.1 Explain the goals of testing
- 1.2.1 Explain the model for software testing and software testing process
- 1.3 1 Describe the software testing life cycle (STLC) and phases
- 1.4.1 Explain software testing methodology
- 1.5.1 Explain how verification and validation of code is done

MODULE – II: Testing Techniques

2.1 To understand Testing techniques
- 2.1.1 explain various dynamic testing techniques
- 2.1.2 Describe Black box testing techniques
- 2.1.3 Describe Boundary value analysis
- 2.1.4 Describe Equivalence class testing
- 2.1.5 State table based testing
- 2.1.6 Describe Decision table based testing

2.1.7 State Cause effect graphing based testing
2.1.8 Describe the method of Error guessing
2.1.9 Describe White box testing techniques
2.1.10 Describe the Need of white box testing
2.1.11 Explain the Logic coverage criteria
2.1.12 Describe Basis path testing
2.1.13 Describe Data flow testing
2.1.14 Describe Mutation testing

2.2 Explain various static testing techniques
2.2.1 Describe the methods of code inspections
2.2.2 Describe how structured walkthroughs are benefitted
2.2.3 State the need of technical reviews
2.2.4 Describe about validation testing
2.2.5 Explain how unit validation testing is carried out
2.2.6 Explain the need and methods of Integration testing
2.2.7 Describe about function testing
2.2.8 Explain system testing
2.2.9 Describe the steps in acceptance testing
2.2.10 Describe what is regression testing
2.2.11 Differentiate between progressive and regression testing
2.2.12 Describe the test for regression testability
2.2.13 State the objectives of regression testing
2.2.14 Explain the different regression testing techniques

MODULE – III: Test Automation and Testing Tools

3.1 To understand test automation and testing tools
3.1.1 Describe advantages of test automation
3.1.2 Explain the Guidelines for automated testing
3.1.3 State the categories of testing tools
3.1.4 Explain the selection of testing tools
3.1.5 Explain the open source testing tools – CUT, Cgreen,Emma and Findbugs
3.1.6 Describe about commercial testing tools – WinRunner, SilkTest, LoadRunner, Jmeter, and TestDirector
3.1.7 State how object oriented testing is done
3.1.8 Describe how testing of web based systems are done

MODULE – IV: Debugging Process
4.1 To understand the process of debugging
4.1.1 Explain the methods of bug tracking
4.1.2 Describe the process of debugging
4.1.3 Explain different debugging techniques
4.1.4 Explain how to correct the bugs
4.1.5 Explain different debugging tools and different types of debuggers

CONTENT DETAILS

MODULE – I: Testing Methodology

Goals of testing - Model for software testing and software testing process - Software Testing Life Cycle (STLC) and phases - Software testing methodology - Verification and validation of code

MODULE – II: Testing Techniques

Dynamic testing techniques - Black box testing techniques - Boundary value analysis, Equivalence class testing, Table based testing, Decision table based testing, Cause effect graphing based testing, method of Error guessing, White box testing techniques - Need of white box testing, Logic coverage criteria, Basis path testing, Data flow testing, Mutation testing

Static testing techniques - Methods of code inspections, Structured walk throughs, Need of Technical reviews, Validation testing, Unit validation testing, Methods of Integration testing, Function testing, System testing, Acceptance testing, Regression testing, Progressive and regression testing, Test for regression testability, Objectives of regression testing, different regression testing techniques

MODULE – III: Test Automation and Testing Tools

Test Automation - Advantages of test automation, Guidelines for automated testing

Testing Tools - Categories of testing tools, selection of testing tools, Open source testing tools – CUT, Cgreen,Emma and Findbugs, Commercial testing tools – WinRunner, SilkTest, LoadRunner, Jmeter, and TestDirector

Object oriented testing, Web based system testing

MODULE – IV: Debugging Process

Methods of bug tracking, Process of debugging, Different debugging techniques, Correcting the bugs, Debugging tools, Types of debuggers

TEXT BOOK(S):

1. Software Testing, Principles and Practice – Naresh Chauhan – Oxford University Press-First Edition.
2.

REFERENCES:

1. Software Engineering : **Ian Sommerville**, Pearson,Nineth Edition
2. Software Engineering a practitioners approach – Roger S Pressman,Seventh Edition

COURSE TITLE	**:**	**MICROCONTROLLER LAB**
COURSE CODE	**:**	**6139**
COURSE CATEGORY	**:**	**A**
PERIODS/WEEK	**:**	**5**
PERIODS/SEMESTER	**:**	**75**
CREDITS	**:**	**3**

General Outcomes :

Sl.	G.O	Student will be able to
1	**1**	To know AVR Assembly Language Programming
2	**1**	To understand Embedded C
	2	To understand AVR Programming in C
3	**1**	To understand Timer/Counter and Interrupt Programming
4	**1**	To understand the interfacing of various systems with AVR microcontroller

Specific Outcomes:

1.1 Familiarisation with microcontroller development system board based AT Mega32 (such as Ardino, MicroHope etc)

1.1.1 The interfacing with computer, transfer of programs, executing simple programs.

1.2 To Understand Assembly Programming of AVR

1.2.1 Write simple assembly language programs (Bit manipulation instructions - on/off , flashing, rotating LEDs)

2.1 Familiarisation with compilers – gcc compiler tools

2.1.1 Write simple programs in AVR using C to implement Bit manipulation, arithmetic and logical, data conversion

3.1 To understand Interrupts and Timer/Counter Programming

3.1.1 Write C programs to demonstrate the working of interrupts and timer/counters

4.1 To understand Interfacing in AVR

4.1.1 Write C programs implement interfacing of peripherals (LCD, Serial port, keyboard, ADC,DAC, sensors)

COURSE TITLE	**:**	**SMART DEVICE PROGRAMMING LAB**
COURSE CODE	**:**	**6138**
COURSE CATEGORY	**:**	**A**
PERIODS/WEEK	**:**	**5**
PERIODS/SEMESTER	**:**	**75**
CREDITS	**:**	**5**

General Outcomes:

1. To install software tools required for mobile technologies
2. To develop simple android applications
3. To design and implement user interfaces
4. To develop applications using data storage
5. To develop mobile applications using HTML 5.0 and JavaScript

Specific Outcomes:

1.1 Install Eclipse/Android studio
1.2 Install android sdk
1.3 Configure eclipse/Android Studio for android

2.1 Create Hello World application
2.2 Create activity bases applications
2.3 Implement programs for Displaying a Dialog Window Using an Activity
2.4 Implement programs for linking Activities with intents
2.5 Implement for Passing Data to the Target Activity
2.6 Implement program for Calling Built-In Applications Using Intents

3.1 Implement program using UI components

1. To Create three pages using layout system - Liner layout, Relative layout and Table layout respectively.
2. To Navigate to these screen from the home page that you created In module 1
3. To Include alert dialog and country listing list view.

3.2 Write android web applications
3.3 Create custom Android Virtual Device(AVD)
3.4 Emulate device with different screen size
3.5 Make SMS and phone call

4.1 Write applications utilising data base and SQLite commands

4. To Create a SQLite database and perform query operations.
5. To Insert data in database table
6. To Retrieve and display details in screen

4.2 Transfer files between emulator and PC
4.3 Create an android application with login page and a home page
4.4 Compile and debug the application.
4.5 Install application in both emulator and device.
5.1 Design and Develop mobile application using HTML 5.0 and JavaScript
5.2 Build HTML 5.0 – JavaScript application using PhoneGap
5.3 Install an application on a mobile device

COURSE TITLE : PROJECT WORK AND SEMINAR
COURSE CODE : 6009
COURSE CATEGORY : A
PERIODS / WEEK : 6
CREDITS : 10

PART 1 - SEMINAR

General outcome:

GO	On completion of this course the students will be able:
1	To get an exposure to innovations in Technology/Information.
2	To develop presentation skills.
3	To develop creative interaction among listeners.
4	To appreciate peers and to give feedback.

Guidelines:

1. Seminar presentation shall be of individual nature rather than group work and shall be coordinated by a guide allotted among the faculty members.

2. Topics shall be constrained to those related to Technology and allied area, but not part of the curriculum.

3. The guide shall provide necessary guidance as to arrive on to the final topic from the area of student's interest and based on the relevance.

4. The topic selected shall help students in acquiring necessary technical knowledge so as to help them in performing better in job interviews or to help them in developing entrepreneurship skills.

5. Presentation shall be for 15 minutes at the minimum.

6. Audio visual aids shall be utilized. Students shall be encouraged to use open source documentation tools like Latex for preparing presentation, posters and seminar reports.

7. Synopsis of the seminar should be submitted at least 3 working days before presentation.

8. Bonafide report containing abstract, content and the reference should be submitted for final evaluation.

9. Seminar evaluation for both continuous assessment and external examination shall be performed in such a way that seminar accounts for 2/10 weightage in terms of total credit for Project work and Seminar.

Seminar evaluation (1/ 5th of total weightage for the course)				
Topic selection (20%)	Presentation (30%)	Interaction (20%)	Slides and presentation aids (15%)	Report (15%)

PART 2 – PROJECT WORK

General outcome

GO	On completion of this course the students will be able:
1	To utilize theoretical and practical knowledge acquired for developing an industry standard product or prototype.
2	To learn financial planning.
3	To enhance team spirit and creative talents for achieving goal.
4	To promote entrepreneurship.
5	To serve industry or community by way of technology transfer.

Guide lines

1. Project selection shall be based on social and technological relevance.

2. Preference shall be given to topics that uphold service to community by way of providing direct technology transfer to society.

   To elaborate the point, technologies such as those provide low cost housing to the society, mechanizing agricultural sector, developing tools that aid in productivity in traditional employment sector are be few examples that may be considered while selecting the topic for Project work. The whole idea is that project work should be utilized as an effective tool as for the community or industry to walk into institutions for materializing innovative ideas irrespective of the sector. In such cases inter disciplinary project works shall also be encouraged.

3. The selected topic should uphold entrepreneurship values. Collaboration with Startup villages or incubation centers shall be used for effective implementation of ideas.

4. Each project team can have a maximum of five members. But in case of projects that demand more human resources, responsibilities can be suitably divided among different team.

5. Every project team shall be allotted with a project guide among faculty members. The project guide shall provide all necessary guidance and maintain a detailed record of individual students involvement in the work and do continuous assessment of the project. Project work holds 8/10 weightage of the total credit.

6. Evaluation shall be done on weekly, monthly and end semester basis.

7. Out sourcing of academic projects are not allowed. If the projects are found to be outsourced, credits shall be forfeited at any point of time.

8. Teaming up with startup village, business incubation centers are highly appreciated.

9. It is required to submit bonafide report of the project for final evaluation.

Project work evaluation (4/ 5^{th} of total weightage for the course)						
Topic selection (20%)	Innovation (10%)	Selection of Tools (20%)	Interface to community/ Industry (10%)	Quality of Work (20%)	Safety aspects (10%)	Report (10%)