

Centurion University of Technology and Management Odisha

(With effect from 2018 Admitted Batch)

COURSE STRUCTURE & SYLLABIS



School of Vocational Education & Training

Course Structure Basket-I

<i>Course Code</i>	<i>Course Title</i>	<i>Course Type</i>	<i>Credits</i>	<i>Prerequisite</i>
DIFC0101	Applied Physics	Theory	3	
DIFC0201	Applied Physics Lab.	Practice	2	
DIFC0102	Applied Chemistry	Theory	3	
DIFC0202	Applied Chemistry Lab	Practice	2	
DIFC0103	Applied Mathematics-I	Theory	4	
DIFC0104	Applied Mathematics-II	Theory	4	
DIFC0105	Applied Mathematics-III	Theory	4	

Basket-II

<i>Course Code</i>	<i>Course Title</i>	<i>Course Type</i>	<i>Credits</i>	<i>Prerequisite</i>
DIFC0106	Communicative English-I	Theory	3	
DIFC0203	Communicative English Workshop-I	Practice	2	
DIFC0204	Communication English Workshop-II	Practice	3	
DIFC0205	Communication English Workshop-III	Practice	3	
FCMG0201	Disaster Management	Theory	3	
FCBS0101	Environmental Science	Theory	3	



DIFC0301	Design Thinking	Project	2	
DIFC0107	Entrepreneurship Management	Theory	3	

Basket-III

<i>Course Code</i>	<i>Course Title</i>	<i>Course Type</i>	<i>Credits</i>	<i>Prerequisite</i>
DIFC0108	Basics of Electronics Engineering	Theory	3	
DIFC0206	Basics of Electronics Engineering Lab	Practice	2	
DIFC0109	Basics of Electrical Engineering	Theory	3	
DIFC0207	Basics of Electrical Engineering Lab	Practice	2	
DIFC0208	Computer Application Lab.	Practice	3	
DIFC0209	Mechanical Workshop	Practice	3	
DIFC0210	Computer Aided Drafting - 2D & 3D (using AUTOCAD)	Practice	3	
DIFC0211	Computer Aided Designing (Electrical Engineering)	Practice	3	
DIFC0212	Computer Aided Designing (Automobile Engineering)	Practice	3	
DIFC0213	Computer Aided Designing (Mechanical Engineering)	Practice	3	
DIFC0214	Computer Aided Designing (Mining Engineering)	Practice	3	
DIFC0215	Computer Aided Designing (Civil Engineering)	Practice	3	

Syllabus

Applied Physics

Subject Name	Code	Type of course	T-P-P Credit	Prerequisite
Applied Physics	DIFC0101	Theory	3	

1. Objective

- To provide fundamental facts, principles, laws, concepts, theories, and formulae to have a scientific understanding of the events occurring in nature and analyze it to design or replicate engineering applications
- To help the students to develop skills to analyze and understand the scientific phenomena, methods of problem solving, and the applications associated.

2. Learning outcome

- Understanding of the laws of Physics behind the behavior of nature
- Knowledge of the basic concepts, principles and theories of physics to analyze any problems in nature, daily life and industry .
- Understanding of the local and global impact of Physics through technology.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	20	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Physics in Application: an Overview	5
2	Physical quantities and their measurement	8
3	Kinematics	8
4	Properties of Matter	12
5	Electricity & Electromagnetism	11
6	Heat & its effect	8
7	Gravitation & Satellite	8
	Total	60

5. Course Contents

Module I

PHYSICS IN APPLICATION: AN OVERVIEW

Mechanical devices, Aerodynamics, Nuclear Energy, Medical Applications (MRI, X-ray), Modern Communication (Mobile, Satellite TV, GPS), Optical Fibers, Laser, Electronic Chips, Automobiles.

PHYSICAL QUANTITIES AND THEIR MEASUREMENT

Physical quantity, Types of physical quantities-Fundamental & Derived, Scalar and vector quantities. Resultant by Triangle law, Parallelogram law & Polygon law, Equilibrant, Resolution of vector, Product of Vectors: Dot & Cross Product.(Definition, Formula & Properties, simple numerical problems).

Unit, Types of units (Fundamental & derived), System of units (MKS, FPS, CGS and SI system of units) and its requirement. Advantages of SI system.

Error, Types of error, Accuracy & Precision.(Brief discussion with simple numerical problems).

KINEMATICS

Force, system of forces, Lami's theorem, Linear motion and kinematic equations of motion, Newton's laws of motion. Inertia. Types of Inertia. Friction, coefficient of friction, Laws of friction, application of friction, its advantages and disadvantages.

Module II

2. PROPERTIES OF MATTER

2.1 Elasticity Deformation, restoring force, stress, strain, Hooke's law, Moduli of elasticity (Young, bulk and rigidity), relation between them, problems, stress-strain diagram for some materials (steel, aluminum, cast iron, concrete), breaking stress, factor of safety. (simple numerical problems)

2.2 Viscosity Newton's law of viscosity, coefficient of viscosity, unit, streamline and turbulent flow, critical velocity, Reynolds's number, problems, Stokes' law, determination of viscosity, factors affecting viscosity. (simple numerical problems)

2.3 Surface tension Cohesive and adhesive forces, angle of contact, surface tension, capillary action, problems, factors affecting surface tension. (Simple numerical problems)

2.4 Capillarity, Formula for height of a liquid in a capillary tube. (Simple numerical problems)

3. ELECTRICITY & ELECTROMAGNETISM

3.1.Coulomb's Law, Electric Field, Intensity of Electric field and Electric Potential, Capacitance, capacitors in series and parallel . Ohm's law, resistance, conductance, resistivity, conductivity, series and parallel combination of resistors, problems, Whetstone's bridge, potentiometer, comparison of emf of cells, internal resistance of cell, heating effect of electric current.

3.2. Magnetic field, magnetic flux, Oersted experiment, Faraday's laws of electromagnetic induction, Lenz law. Principles of Transformer, Motor & Generator.

3.3. Semi Conductor Physics: Energy Bands in Conductor, Semi-Conductor& Insulator, Chemical Bonds in Semiconductor, Intrinsic and Extrinsic Semiconductors, PN-Junction Diode, Working, Biasing and Characteristics Curves.

Module III

HEAT & ITS EFFECT: Heat, Definition & Properties Types of Thermal Expansion, Coefficients of Thermal expansion, Relation between thermal coefficients ((Formula only) Specific heat, C_p & C_v , Relation between C_p & C_v (Formula only.) . Modes of heat transfer, Thermal conductivity. Working principle of Heat engine.

GRAVITATION & SATELLITE

Gravitation & Satellites: Newton's law of Gravitation, Acceleration due to Gravity, Kepler's laws of Planetary Motion (statement only), Artificial Satellite (simple idea), Geo-Stationary Satellites, Escape Velocity, Velocity & Time Period of an Artificial Satellite. Brief idea about Circular motion, Rotational motion.

Text Books:

1. Text Book of +2 Physics – Vol-I & II by Barik, Das & Sharma (Klayani Publishers).
2. Engineering Physics by Gaur & Gupta (Dhanpat Rai & Co., New Delhi)

Reference Books:

1. Pradeep's Fundamental Physics for Class11 by by K. L. Gomber and K. L. Gogia.
2. Pradeep's Fundamental Physics for Class12 by by K. L. Gomber and K. L. Gogia.

Applied Physics Lab.

Subject Name	Code	Type of course	T-P-P (Credit)	Prerequisite
Applied Physics Lab.	DIFC0201	Practical	4	

1. Objective

- To gain practical knowledge by applying the experimental methods to correlate with the Physics theory.
- Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results.
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2. Learning outcome

- Apply the various procedures and techniques for the experiments.
- Apply the analytical techniques and graphical analysis to the experimental data.
- Use the different measuring devices and meters to record the data with precision.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Experiments	50	Written & Hands on Practice
External Examination		50	Written & Hands on
Total		100	

4. Course Contents

Sl. No	Topics(Any Ten)	Periods
1	Measurement of volume of a solid cylinder by Vernier Caliper.	3
2	Measurement of thickness of a hollow cylinder by Vernier Caliper.	3
3	Measurement of radius of a wire by Screw gauge.	3
4	Measurement of radius of curvature of a spherical surface by Spherometer.	3
5	Determination of coefficient of friction by inclined plane method.	3
6	To find out the value of “g” by using Simple pendulum.	3
7	To determine the mass of two different objects using a beam balance.	3
8	To find the weight of a given body using parallelogram law of vectors.	3
9	Determination of thermal conductivity of bad conductor by Lee’s disc method.	3
10	Determination of thermal conductivity of good conductor by Searle’s method.	3
11	Determination of Specific gravity of insoluble solid heavier than water by physical balance by equal oscillation method.	3
12	Study of characteristics of PN-Junction diode.	3
13	Measurement of specific resistance of wire by a Meter Bridge.	3
14	To determine young’s modulus of elasticity of the material of a given wire.	3
15	To determine the surface tension of water by capillary rise method.	3
Total		30

Applied Chemistry

Subject Name	Code	Type of course	T-P-P (Credit)	Prerequisite
Applied Chemistry	DIFC0102	Theory	3	

1. Objective

- To learn the laboratory skills needed to design, safely conduct and interpret chemical research
- To acquire a foundation of chemistry of sufficient breadth and depth.

2. Learning outcome

- Understanding of the local and global impact of scientific technology on individuals, organizations, and society.
- Knowledge to test and apply for evolution

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	20	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Fundamentals of structure of matter	16
2	Acid, Base, Salt and Solutions	8
3	Industrial Gases	8
4	Inorganic Chemicals	8
5	Water	4

6	Material of industrial importance	6
Total		60

5. Course Contents

Module I

Fundamentals of structure of matter

Properties of Atom: Atomic mass, molecular mass, equivalent mass Atomic structure (Bohr's atomic model), Electronic configuration Periodic classification of elements and their properties. Types of Bonding (Ionic bond, covalent bond, coordinate bond and metallic bond)

Acid, Base, Salt and Solutions:

Theories of acid and base, Neutralization reaction, Equivalent weight of Acid, Base and Salt. Normality, Molarity and Molality. pH and its importance in industrial application (Simple Numerical Problems)

Module II

Industrial Gases

Usefulness and hazards in handling important industrial gases with special emphasis on of the following gases: oxygen, nitrogen, helium, hydrogen, acetylene, carbon monoxide, chlorine, fluorine, and sulphur dioxide.

Inorganic Chemicals

Application, hazards in handling the following chemicals: hydrochloric acid, nitric acid, sulphuric acid, caustic soda, borax, bleaching powder, sodium thiosulphate, hydrogen peroxide, potash alum, chrome alum, potassium dichromate and potassium permanganate.

Water

Specification and industrial uses of water, determination of alkalinity, acidity, hardness, dissolved oxygen and chloride content

Module III

Material of industrial importance

Coal: Types of coal, properties, calorific value, distillation of coal, chemicals derived from them.

Petroleum– Composition of crude petroleum, Refining and different types of petroleum products and their applications.

Lubricants-Classification of lubricants, Properties of Lubricants (Viscosity index, cloud point, pore point) and their determination

Metals and alloys: Important metals and Alloys, Iron, Copper, Aluminum, Lead, Nickel, and their application –mechanical and chemical properties and their applications.

Cement: Types of cement, composition, manufacturing process, setting of cement.

Polymer: Industrial polymers and its classification and composite materials, their constitutions, Industrial applications.

Corrosion: Types of corrosion, Factors influencing corrosion, Corrosion control

Reference

E-content:

<https://www.youtube.com/watch?v=pkPe0seI1Zk>

<http://home.earthlink.net/~dayvdanls/lecw2basicchem.html>

Text Books:

- Text Book of +2 Chemistry – Vol-I by Nanda, Das & Sharma (Kalyani Publishers).
- Text Book of +2 Chemistry – II by Nanda, Das & Sharma (Kalyani Publishers)

Reference Books:

1. Industrial chemistry by B.K . Sharma by Krishna Publications.

Applied chemistry Lab

Subject Name	Code	Type of course	T-P-P (Credit)	Prerequisite
Applied chemistry Lab	DIFC0202	Practical	4	

2. Objective

- The student will learn the laboratory skills needed to design, safely conduct and interpret chemical research
- The student will acquire a foundation of chemistry of sufficient breadth and depth.

3. Learning outcome

- To synthesize, separate and characterize compounds
- Knowledge and understanding of the issues of safety regulations in the use of chemical in their laboratory.

4. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	50	Written examination/viva
External Examination		50	Written examination/viva
Total		100	

5. Course Contents

Sl. No	Topics(Any Ten)	Periods
1	Alkalimetry Titration	3
2	Acidimetric Titration	3
3	Measurement of pH of different solution.(HCl/NaOH/NaCl)	3
4	Constituents determination of <ul style="list-style-type: none"> • Soil sample • Water sample 	3

	<ul style="list-style-type: none"> • coffee 	
5	Food Adulteration Tests: Find if your kitchen ingredients are adulterated (Turmeric Powder, Condensed milk, Mustard/Coconut Oil)	3
6	Determination of moisture content in a soil .	3
7	Determination of total hardness of water by EDTA method.	3
8	Determination of pH of a soil sample.	3
9	Mystery Powder: Identifying unknown Salt (Acid radicals.) <ul style="list-style-type: none"> (i) Carbonate (ii) Sulphate (iii) Chloride (iv) Nitrate 	3
10	Mystery Powder: Identifying unknown Salt (Basic radicals) <ul style="list-style-type: none"> (i) Ammonium (ii) Copper (iii) Calcium (iv) Potassium 	3
11	Determination of MgO content in a given cement sample.	3
12	Determination of pH of given water sample.	3
13	Preparation of soap	3
14	Determination of flash point and fire point of lubricating oil	3
15	Determination of MgO content in a given cement sample.	
Total		30

Mathematics I

Subject Name	Code	Type of course	T-P-P (Credit)	Prerequisite
Mathematics I	DIFC0103	Theory	4	

1. Objective

- Ability to solve problems in mathematics using appropriate technology, translating problems from one form to another, using various problem-solving strategies.

2. Learning outcome

- Students will demonstrate an understanding of the common body of knowledge in mathematics.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	20	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Application of general mathematics	12
2	Analytical geometry	18
3	Three dimensional geometry	18
4	Complex Number	12
	Total	60

6. Course Contents

Module I

Application of general mathematics

Ratio and Proportion, Percentage, Simple Interest, Average, Problems on age, Distance and time problems, AP and GP.

Module II

Analytical geometry

Representation of a point in co-ordinate plane, formula for (i) Distance between two points.(ii) Division formula (internal and external), (iii) Area of the triangle whose vertices are given. Define slope of a line and find angle between two lines, Conditions of perpendicularity and parallelism of two lines. Define

locus and equation of locus from the given conditions. Define standard forms of straight lines . Area and perimeter of triangle,rectangle,square,parallelogram,rhombus, trapezium

Define circle ,Find equation of circle with given center and radius, general equation of a circle and find its centre and radius. Area and perimeter of circle, Length of arc and area of sector . Basic concept of ellipse, parabola, hyperbola

Module III

Three dimensional geometry

Representation of a point in 3D plane, formula for (i)Distance between two points , (ii)Division formula Explain Dcs& Drs of a line, angle between two lines with given Drs, Conditions of perpendicularity and parallelism.

Define sphere, Find the equation of a sphere whose centre and radius are given, and find the centre and radius from the general equation of sphere. Surface area and volume of cylinder, Surface area and volume of cube and cuboid , Surface area and volume of cone , Surface area and volume of sphere and hemisphere , Surface area and volume of pipe.

Complex number

Define complex number, parts of a complex number, conjugate, Modulus and amplitude of a complex number. Representation of a complex no. , properties of complex number, rationalization of a complex no. Square root and cube root of a complex no. and its properties. State De' Moiver's theorem and its application for determination of nth roots of unity.

Text Books:

- Quantitative Apptitude by Dr. R. S. Aggarwal
- Elements of Mathematics Vol. I & Vol. II

Reference Books:

- Mathematics by R. D. Sharma
- Topics in Mathematics
- Higher Secondary Mathematics

Mathematics II

Subject Name	Code	Type of course	T-P-P (Credit)	Prerequisite
Mathematics II	DIFC0104	Theory	4	

1. Objective

- Know about basic concepts of statistics.
- Develop the ability to read, understand, and use basic definitions in linear and abstract algebra and real analysis, and be able to prove simple consequences of these definitions

2. Learning outcome

- Ability to represent and utilize mathematical concepts in various ways.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	20	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Trigonometry	10
2	Statistics	10
3	Determinants and matrices	15
4	Vector algebra	15
5	Binomial Theorem	10
	Total	60

5. Course Contents

Module I

Trigonometry

Trigonometric ratios, trigonometric value table, basic formulas of trigonometry. Sine and Cosine formula. Inverse trigonometric functions and its formula.

Statistics

Average, mean, median, mode. Mean deviation, variance, standard deviation of ungrouped or grouped data. Analysis of frequency with equal means. Analysis of frequency with different variances.

Module II

Determinants and matrices

Define determinant (second and third order), minor, CO-factor. Study properties of determinants, Cramer's Rule: (solutions of simultaneous equations of two and three unknown). Define matrix and its representation, state its order, types of matrices with examples. Perform Addition, subtraction and multiplication of a matrix with a scalar and multiplication of matrices (up to third order only). Define transpose, adjoint and inverse of a matrix up to third order.

Module III

Vector algebra

Define scalars and vectors, types of vectors, magnitude and direction of a vector, explain algebra of vectors. Multiplication of vectors and its type (dot and cross), explain dot product of two vectors, properties of dot product, projection formulae. Define cross product of two vectors, properties of cross product, finding the area of triangle and parallelogram. Scalar triple product, finding volume of parallelepiped, coplanar vectors.

Binomial theorem

Factorial notation, how to find factorial of any positive integer, formula and use of Permutation and combination . Statement of Binominal Theorem for positive integral index, properties of binomial expansion. Establish the formula for General terms, middle term/ terms and term independent of x in an expansion. Establish the relationship between Binomials co-efficient.

Text Books:

- Elements of Mathematics Vol. I & Vol. II

Reference Books:

- Mathematics by R. D. Sharma
- Topics in Mathematics
- Higher Secondary Mathematics

Mathematics III

Subject Name	Code	Type of course	T-P-P (Credit)	Prerequisite
Mathematics III	DIFC0105	Theory	4	

1. Objective

- Familiarization with mathematical structure with view to develop their knowledge, skill& perceptions about the applied science.
- Develop logical thinking
- Principle & applications in Engineering are firmly ground on abstract mathematical structure.

2. Learning outcome

- Students will demonstrate their ability to think critically about mathematics by applying key theories, concepts, and methods of inquiry in mathematics to novel problems, to other disciplines.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	20	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Probability	08
2	Calculus	30

3	Laplace Transformation	12
4	Fourier Series	10
Total		60

5. Course Contents

Module I

Probability

Random experiments; outcomes, sample spaces (set representation). Events; occurrence of events. Probability, Probability of an event. Random variable and its probability distribution, mean and variance of random variable.

Module II

Calculus (limits, derivatives, integration, differential equation)

Define Variables, constants, function of real variables, different functions. Explain Limit of a function, R.H. Limit, L.H. Limit & existence of Limits. Methods of evaluating Limit (Finite & Infinite Limits). Standard formulas of Limit. Define continuity of a function at a point.

Fundamental theorem on derivative Viz (addition rule, subtraction rule, product rule and quotient rule). Standard Derivative of functions. Perform derivative of composite function(chain rule). Differentiation of parametric function, Differentiation of Implicit Function, Differentiation of a function with respect to another Function. Define Successive Differentiation (up to 2nd Order)

Explain functions of several variables, State partial derivatives of several variables.

Define Integration as inverse process of differentiation, Define indefinite and definite Integral, State Integrals of standard functions Integration by parts. Definite Integrals, properties of Definite Integrals.

Define differential equation, order and degree of a differential equation. Formation of differential equation, Solution of differential equation by the following methods Separation of variables.

Module III

Laplace Transformation

Definition of Laplace transformation and inverse Laplace transformation, Formula for standard functions, properties of Laplace transformation.

Fourier Series

Definition of periodic functions. Dirichlet's conditions for the Fourier expansion, Statement of Euler's formulae.

Text Books:

- Elements of Mathematics Vol. I & Vol. II

Reference Books:

- Mathematics by R. D. Sharma
- Topics in Mathematics
- Higher Secondary Mathematics

Communicative English-I

Subject Name	Code	Type of course	T-P-P (Credit)	Prerequisite
Communicative English-I	DIFC0106	Theory	3	

1. Objective

Key points:

- To prepare students with grammar & written language skills for successful communication.
- To develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking, Writing.

2. Learning outcome

Key points:

- Development of grammatical competence.
- Ability to write clearly & effectively.
- Confidence level improvement.

3. Evaluation Systems

Key points: State clearly the components, weights and methods of evaluation system.

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	30	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Grammar and Sentence Formation	25
2	Writing skill	17
3	Vocabulary building	8
	Total	50

Module I

Grammar

1. Parts of speech

1.1. What is part of speech?

1.2. Types of part of speech(noun, pronoun, adjective, verb, adverb, preposition, conjunction, interjection)

1.3. To form sentences using part of speech.

2. Article

- 2.1. What is an article?
- 2.2. Types of articles(definite, indefinite)
- 2.3. Uses of different articles(a, an, the)
- 2.4. To use correct articles before noun in the sentence formation.
3. Determiners
 - 3.1. Meaning of determiner.
 - 3.2. Types of determiners.(articles, demonstrative, possessive, quantifiers, numerals)
 - 3.3. Uses of different types of determiners.
 - 3.4. To form sentences using determiners.
4. Tenses
 - 4.1. What is tense?
 - 4.2. Types of tenses.
 - 4.3. The use of tenses.
 - 4.4. To form sentences by using different types of tenses.
5. Sentence formation
 - 5.1. What is a sentence?
 - 5.2. Basic sentence structure(subject, predicate, object, indirect object, complement)
(To form sentences following basic sentence structure)
 - 5.3. Types of sentences(simple or declarative, command or imperative, question or interrogation, exclamatory)
 - 5.4. To construct different types of sentences using parts of speech, articles & determiners.

Module III

Writing skill

6. Paragraph writing
 - 6.2. What is paragraph writing?
 - 6.3. How to write a paragraph?
 - 6.4. Features of paragraph writing(unity, order, coherence, completeness)
 - 6.5. Types of paragraph writing(general-to-specific , process description)
 - 6.6. To write paragraphs based on (general –to-specific & process description).
 - 6.7. To write paragraph on the experiments performed in the lab.
8. Precis writing
 - 8.1. What is precis writing?
 - 8.2. Rules of making a précis.
 - 8.3. To construct précis of 60 to 70 words from a general –to-specific paragraph.

Module IV

Vocabulary building

- 8.1. What is vocabulary?
- 8.2. Word formation by using(prefix, suffix)
(To use appropriate prefixes & suffixes to the verb in sentence formation.)
- 8.3. Define blend words.
(To identify & use the blend words in the sentence.)
- 8.4. Define compound words.
(To identify & use compound words in the sentence.)

8.5. Synonyms & Antonyms

(To practice the synonyms & antonyms of words and to use them in sentences)

8.6. Homophones

(To construct sentences in present & past tense using homophones)

Reference Books:

3. Communicative English by Abhisek Arora, Kalyani Publishers
4. Communicative English by Kajal Sinha, Amita Publication

Online Source: <https://owl.english.purdue.edu>, <https://www.fluentu.com>, <https://busyteacher.org>

Communicative English-I Workshop

Subject Name	Code	Type of course	T-P-P (Credit)	Prerequisite
Communicative English-I Workshop	DIFC0203	Practical	2	

1. Objective

- To prepare students with grammar & written language skills for successful communication.
- To build the vocabulary, comprehension, and writing skills of the students for effective communication in English language
- It will focus on developing the grammatical structures accurately and form effective & coherent sentences.

2. Learning outcome

- Development of grammatical competency
- Ability to write clearly and effectively

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	50	Written examination/viva
External Examination		50	Written examination/viva
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	ICE-BREAKING/INTRODUCTORY SESSION Knowing each other, name game & other ice-breaking activities.	6
2	CONVERSATION PRACTICE-1 <ul style="list-style-type: none"> • Use Parts of speech, formulaic expression • Small skits using formulaic expressions • Paper reading before an audience (reading unseen passages), Situational Dialogues – Role-Play- Expressions in Various Situations. 	9
3	ELIMINATION OF COMMON GRAMMATICAL ERRORS-I Emphasis on tense, verb, modals, active & passive voice, statement, questions & response, articles, prepositions	6
4	SOUNDS OF ENGLISH Word accent, Intonation & common error in pronunciation	6
5	EXTEMPORE	6
6	VOCABULARY BUILDING-I Word formation by using (prefix, suffix), Blend words & Compound words Synonyms, Antonyms & Homophones	12
Total		45

Reference

E-content:

<https://owl.english.purdue.edu>,

<https://www.fluentu.com>, <https://busyteacher.org>

Communicative English-II Workshop

Subject Name	Code	Type of course	T-P-P	Prerequisite
Communicative English-II Workshop	DIFC0204	Practical	3	

6. Objective

- To develop better oral communication skills by a variety of communication activities, from informal discussion to formal presentation.
- To integrate basic skills involving information technology and thinking.

7. Learning outcome

- To participate effectively in formal & informal conversation in real life situation.
- To comprehend conversations & short talks delivered in English.
- To prepare, organize, and deliver an engaging oral presentation.

8. Evaluation Systems

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	50	Viva & Assignments
External Examination	End Term	50	Viva & Assignments
Total		100	

9. Course Contents

Sl. No	Topics(Any Ten)	Periods
1	Reading for comprehension and vocabulary(reading loud) <ul style="list-style-type: none"> • Reading abridged text on relevant topics • Reading news articles • Answering questions-oral 	10
2	Reading for comprehension and vocabulary (silent reading) <ul style="list-style-type: none"> • Unknown Passage Reading • Vocabulary Building • Reading & Answering Questions 	10
3	Listening skill <ul style="list-style-type: none"> • Listening to news broadcast, events on youtube and comprehending • TED talks, Short documentary listening and comprehending • Listening and typing – Listening and sequencing of sentences – Filling in the blanks • Listening and answering questions. 	20
4	Speaking skill <ul style="list-style-type: none"> • Correct Pronunciation • Conversations: Face to Face Conversation – Telephone conversation – Role play activities (Students take on roles and engage in conversation) • Presentation 	30

	<ul style="list-style-type: none"> • Interview 	
5	<p>Understanding communication in business</p> <ul style="list-style-type: none"> • Role plays (difference in style/ degree of formality) using formulaic expressions, degrees of formality to informality in expression • Role plays (Formal & Informal meeting) <p>With opening address, guest introduction, vote of thanks using formal & informal body language</p>	20
Total		90

7. Reference

Online Source:

- <https://www.scribd.com/document/305109104/Principles-of-Effe>
- <https://www.businesscommunicationarticles.com/principles-of-effective-oral-communication/ctive-Oral-Communication>
- <https://gdpi.hitbullseye.com/other-selection-tools-extempore.php>

Communicative English-III Workshop

Subject Name	Code	Type of course	T-P-P Credit	Prerequisite
Communicative English-III Workshop	DIFC0205	Practical	3	

1. Objective

- To develop an ability to exchange information, to plan, to maintain Co-ordination and Co-operation.
- Developing ability to solve problem, increase job satisfaction.

2. Learning outcome

- Effective Business Communications
- Developing And Delivering Effective Presentations
- Effective Interpersonal Communications
- Skills that maximize Team Effectiveness
- Time Management and effective Problem Solving

3. Evaluation Systems

Internal Examination	Component	% of Marks	Method of Assessment
		Midterm Test	50
External Examination		50	Written examination/viva

Total		100	
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4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Writing short paragraphs general, current & technical topics	10
2	Writing short paragraphs (personal, semi-formal, formal)-	10
3	Writing job application (for the post of “Sale manager, Supervisor, Lab assistant, Lecturer)	15
4	Business Letter(enquiry, order, complaint, cancellation)	15
5	Resume Writing & Email writing	15
6	Group discussion on current topics-General, Social, Political, Management, Creative, Education & Sports.	15
7	Personal interview Talking about self, small talk on simple topics Preparing answer for mock-interviews	10
Total		90

Reference Books

- Communicative English by Kajal Sinha, Amita Publication

Online Source:

- <http://blog.tesol.org>,
- <https://busyteacher.org>,
- <https://www.fluentu.com>

Disaster Management

Subject Name	Code	Type of course	T-P-P	Prerequisite
Disaster Management	FCMG0201	Theory	4	

1. Objective

- To provide students an exposure to disasters, their significance, types & Comprehensive
- Understanding on the concurrence of Disasters and its management.
- To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention, risk reduction and the basic understanding of the research methodology for risk reduction measures.

- To develop rudimentary ability to respond to their surroundings with potential disaster response

2. Learning outcome

- Develop perspective understanding and its Management in pre, during and post phases of Disasters.
- Equipped with potential knowledge, concepts & skills for effective Planning on Disaster Management and Risk Reduction measures.
- Application of the concepts in real life scenario.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	20	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Introduction to Disaster Management	04
2	Effect and Impact of Disaster	10
3	Disaster Risk Management	10
4	Disaster Management	15
5	Humanitarian Charter and Minimum Standards in Humanitarian Response	06
6	Disaster Management Projects	15
	Total	60

5. Course Contents

MODULE-I

Disaster & Emergencies: Concept & Fundamentals of Disaster Management; Introduction/ Brain storming/Group formation History of Disasters. **Concepts and Definitions;** Hazard, Risk, Vulnerability, Capacity, Disaster & Equations of Disaster Management, Types & Classification of Disasters, Factors responsible for disasters like flood, cyclone and Earthquake.

Effect and Impact of Disaster: Disasters Impact – Social, Economic, Political, Environmental, Health, Psychosocial, etc. Differential impacts in terms of Caste, Class, Gender, Age, Location, Disability.

Disaster vs Development: Disaster is the causes of destruction. Disaster leads to development.

Global warming and climate change: Concept and understanding of global warming and climate Change, Causes and factors. Remedial measures

MODULE –II

Community Managed Disaster Risk Reduction And Village Contingency Plan: Hazard analysis and assessment, Vulnerability analysis, Resource capability assessment, Mapping & Seasonality Calendar, Structural and Non Structural assessment. Role of Task force/ODRAF/ NDRF for DRR at community level. Rapid Need Assessment Pre and Post Disaster, **Stress Management:** Causes and consequences of Stress, what are the best ways to handle pressure, Psychosocial Support

Disaster Management: Disaster Management Cycle, Phases of Disasters Prevention, Mitigation Preparedness, Warning, Response, Rehabilitation, Reconstruction.

MODULE-III

Humanitarian Charter and Minimum Standards in Humanitarian Response; The Humanitarian Charter, Protection Principles, Core Standards, Water , Sanitation & Hygiene Promotion, Food Security & Nutrition, Health Services, Shelter and Settlement.

Disaster Management Projects:

Adapting Climate Change, Disaster Resilience Structures and Buildings, IT in Disaster Management, Inter- relationship between Disasters and Development, Urban Disaster, Rain Water Harvesting, Inclusions – Disability, Aged, Social etc

www.adpc.net

Text Books:

1. Natural Hazards and Disasters by Donald and David Hyndman.
2. Disaster Management by Tej Singh
3. Towards Basic of Natural Disaster by D.K. Sinha

Reference Books:

1. Disaster Reference : A hand book for Emergencies by Babu Thomas
2. Introduction to Hazards by S.B. Reed
3. Man Made Disaster by B.A. Turner

Environmental Science

Subject Name	Code	Type of course	T-P-P Credit	Prerequisite
Environmental Science	FCBS0101	Theory	4	Fundamentals of Science

1. Objective

- To understand the concept of multi-disciplinary nature of Environmental Science where different aspects are dealt with a holistic approach.
- Understand the natural environment and its relationships with human activities.
- One must be environmentally educated.
- Characterize and analyze human impacts on the environment.

2. Learning outcome

- Students will develop a sense of community responsibility by becoming aware of environmental issues in the larger social context.
- Integrate facts, concepts, and methods from multiple disciplines and apply to environmental problems.
- Design and evaluate strategies, technologies and methods for sustainable management of environmental systems and for the remediation or restoration of degraded environments.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
		Midterm Test	30
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Environment and its multidisciplinary nature	4
2	Renewable and non - renewable resources	10
3	Structure and function of ecosystems	10
4	Biodiversity and its conservation	08
5	Environmental Pollution	08
6	Solid-waste management	5
7	Social issues and the environment	15
Total		60

5. Course Contents

MODULE-I

Environment and its multidisciplinary nature; Need for public awareness; Renewable and non - renewable resources–forest, water, mineral, land, food and energy resources; Energy flow in the eco systems. Food chains, food webs and ecological pyramids. Structure and function of ecosystems of forest, grass land, desert and aquatic types.

MODULE -II

Biodiversity and its conservation: Biodiversity at global, national and local levels; Threats to biodiversity - Habitat loss; wild life poaching and man - wildlife conflicts; Endangered and endemic species; conservation measures.

Environmental Pollution: Causes, effects and control measures of air, water and noise pollution; Nuclear hazards; **solid-waste management:** Causes, effects and control measures; Management of disasters due to natural causes of floods, earthquakes, cyclones and landslides.

MODULE-III

Social issues and the environment; Sustainable environment, Water conservation measures; Rain water harvesting; Resettlement and rehabilitation of people; Climate change and global warming; Acid rain;

Ozone layer depletion; water land reclamation; Consumerism and waste products; Features of Environment Protection Act, Air pollution and Control of Pollution Acts; Water Pollution and its Control Act. Effects of Pollution explosion on environment and public health; Need for value education to Protect environment and resources.

Text Books:

3. Anubhav Kaushik & C.P. Kaushik : Environmental Studies-New age International Publishers.
4. Environmental Engineering & Safety by B.K.Mohapatra.

Reference Books:

1. Benny Joseph : Environmental Studies-Tata Mac Graw Hill
2. E. Bharucha : Text book of Environmental Studies for Under graduate courses– Universities Press.(Book prepared by UGC Committee.

Design Thinking

Subject Name	Code	Type of course	T-P-P Credit	Prerequisite
Design Thinking	DIFC0301	Project	2	

1. Objective

- Define and Recognize the significance of innovation
- Discuss and Examine the approaches to innovation through design thinking
- Describe the design thinking process, practices and their applications
- Apply the design thinking to problem solving

2. Learning outcome

- Key concepts and principles leading to innovation
- Fundamental principles that guide design thinking mindset
- Understanding design thinking as a tool to problem solving

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Project	50	Presentation & Report
External Examination		50	Presentation & Report
Total		100	

4. Course Contents

(Students as individual / group will be asked to choose a problem in their surrounding belonging to any sector/area, and offer a solution applying the approach of Design Thinking.)

Everyone is a Designer

- Understand class objectives & harness the designer mindset

The Wallet/Bag Challenge

- Gain a quick introduction to the design thinking methodology
- Go through all stages of the methodology through a simple design challenge

Teams & Problems

- Start Design Challenge and learn about teams & problems through this
- Foster team collaboration, find inspiration from the environment and learn how to identify problems

Empathizing

- Continue the Design Challenge and learn empathy
- Learn techniques on how to empathize with users
- Go to the field and interview people in their environments

Interpreting

- Organize the information from the interview, build own point of view
- Reframe the Problem based on the facts during the interview, if required.
- Develop the grounded theory

Ideating

- Continue Design Challenge and learn how to brainstorm effectively
- Encourage exploration and foster spaces for brainstorming

Prototyping

- Continue Design Challenge and learn how to create effective prototypes
- Build tangible models and use them as communication tools
- Start giving constructive feedback to classmates and teammates

Testing

- Finish Design Challenge and iterate prototypes and ideas through user feedback
- Evolve ideas and prototypes through user feedback and constructive criticism
- Get peer feedback on individual and group performance

Reference Books

Field Guide to Human Centered Design

Design for Social Impact: A How-To Guide

Design Thinking for Educators, 2nd Edition

Recommended ONLINE Reading:

- *Change by Design* by Tim Brown
- *Design for the Real World* by Victor Papanek
- *This is Service Design Thinking* by Marc Stickdorn and Jakob Schneider
- *Applied Imagination: Principles and Procedures of Creative Problem Solving* by Alex F. Osborn
- *The Back of the Napkin* by Dan Roam
- *The Designful Company* by Marty Neumeier
- *Unstuck: A Tool for Yourself, Your Team, and Your World* by Keith Yamashita and Sandra Spataro
- *Wicked Problems in Design Thinking* by Richard Buchanan
- *Designing for Service: Creating an Experience Advantage* by Hugh Dubberly and Shelley Evenson

Entrepreneurship Management

Subject Name	Code	Type of course	T-P-P	Prerequisite
Entrepreneurship Management	DIFC0107	Theory	3	

1. Objective

- Understanding of entrepreneurship as a career option after study
- Idea about how to launch a start-up
- Understanding several aspects of entrepreneurship through case studies.

2. Learning outcome

- Skills to be a successful entrepreneur
- Setting up of a start-up and process around it
- Government policies and facilities available for start ups

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	20	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Entrepreneurship	10
2	Start up	3
3	Startup development phases:	4
4	Enablers & Types	4
5	Preparing to Launch	4

6	Financing startups	4
7	Copyrights / Patenting	4
8	Case studies	4
9	Startup policies	8
Total		45

Module I:

Entrepreneurship: Entrepreneurship concept – Entrepreneurship as a Career – Entrepreneurial Personality - Characteristics of Successful, Entrepreneur – Knowledge and Skills of Entrepreneur. Business Environment - Role of Family and Society - Entrepreneurship Development Training and Other Support Organizational Services - Central and State Government Industrial Policies and Regulations - International Business.

Module II:

Start up: Definition, Startups ecosystem: support organizations, big companies, universities, funding organizations, service providers, research organizations.

Startup development phases: Ideating, concepting, committing, validating, scaling, establishing.

Enablers: Incubators, accelerators, hackathons, Startup events

Types: Proprietorship, Company, Co-founders, Startup business partnering

Preparing to Launch: Essential Components, Intellectual Property, Branding, Strategy,

Financing startups: Different stages of financing; Co-founders, FFF, Angels; Venture Capitals, Acquisition/ mergers, Strategic alliances; IPO, Factors of success and failures, Restarters, Trends and obstacles.

Copyrights / Patenting: Policies and processes regarding IPR, Examples of copyrights and patents,

Module III:

Case studies: Startup India, Make in India, Case study on Startup village, Kochi; 10000 Start-ups of NASSCOM and Silicon Valley, USA.

Startup policies of Central Government and some leading State Governments Technology Business Incubator (TBI), Role of National Science and Technology Entrepreneurship Development Board (NSTEDB), DST guidelines for Seed Support System (SSS) for Startups in Incubators. Micro, Small and Medium Enterprises, Incentives available to MSME as per the latest IPR. Role of DIC, OSFC, OSIC, IDCO, SIDBI, IPICOL and Commercial Banks in the context of MSME

Text Books:

1. Entrepreneurship for Engineers : B.Badhai
2. Principles & Practice of Management : L.M.Prasad

Reference Books:

1. Mercantile Law: N.D.Kapoor
2. Industrial Engineering & production Management: M.Mahajan

Basic Electronics

Subject Name	Code	Type of course	T-P-P	Prerequisite
Basic Electronics	DIFC0108	Theory	3	

1. Objective

- To offer a clear overview of the recent trend in application and manufacturing involved in Electronics Engineering
- To identify the important electronic components, understand their operation and application
- To understand the operation, designing, and application of important electronic circuits for device level application

2. Learning outcome

- Knowledge of the current pattern of designing an Electronic application
- Skill of testing, designing and improving the architecture of components and circuits for electronic devices
- Knowledge of the evolving areas and strategies in electronic applications

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	20	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Recent Trends in Electronic Application: The Big Picture	5
2	Electronic Manufacturing : a Shift in Paradigm	6
3	Components for Electronic Circuits	15
4	Sensor Design	10
5	Circuits for Electronic Device	15
6	Familiarization to Single Board Computer (SBC) system	5
7	Electronics: The New Trends	4
	Total	60

Module I

Recent Trends in Electronic Application: The Big Picture

Smart Electronics-Few Case Studies: Wearable Devices, Home Automation, Driver less Car / Self Driving Car, Inside a Smart Phone

Electronics in Trans-disciplinary Applications: Automotive, Space, Underwater, Medical, Mining, Manufacturing, Industrial Automation, Robotics, Agriculture

Electronic Manufacturing: a Shift in Paradigm

Semiconductor devices, Integrated Circuits (IC), System on Chip (SoC), Printed Circuit Board (PCB): Single layer PCB, Double layer PCB, Multi-Layer PCB, Rigid & Flexible PCB, Flex-rigid PCB, Aluminum Backed PCB, 3D Printed PCB

Module II

Components for Electronic Circuits

Passive Components: Resistor, Potentiometer, Capacitor, Inductor, Connectors, Switches & Relays.

Active Components: PN, Zener, Photo diode, Light Emitting Diode (LED), Bipolar Junction Transistor (BJT), field Effect Transistor (FET)

Sensors: Types, and Applications: Analog Sensors , Digital Sensors, Special Sensors

Actuators: Types of Actuators, Applications

Integrated Circuits

Sensor Design

Sensors and Smart Sensors, Reading Sensor Input, Sensor Wiring, Designing a Sensor, Infrared Reflectance Sensor, Resistance Temperature Detectors, Temperature Sensor(LM35,Thermistor), Motion Sensor, Limit Switch/Sensor, Touch Sensor Circuit

Module III

Circuits for Electronic Device

Voltage Regulator: Linear Regulators (LM723,78XX,79XX), Switching Regulators(LM2676), SCR regulators, Hybrid Regulators

Amplifier: Voltage Amplifier, Current Amplifier, Power Amplifier

Switch: Relay, Diode as a Switch, Transistor as a Switch

Oscillator: Harmonic Oscillator, Voltage Controlled Oscillator

Familiarization to Single Board Computer (SBC) system

SBC system ,Features of Available SBC Boards: Arduino-UNO / Nano, NodeMcu / Wemos-D, Raspberry Pi, Applications using SBC (overview only), Internet of Things (overview only)

Electronics: The New Trends

Green Electronics, Organic Electronics, Bio-Electronics, Nano Electronics, Polymer Electronics, Molecular Electronics

A. Reference

E-content:

<http://www.instructables.com/id/Basic-Electronics/>

<http://www.nptelvideos.in/2012/11/basic-electronics-prof-tsnatarajan.html>

<http://nptel.ac.in/courses/112108092/37>

Text Books:

5. Grob's Basic Electronics by Mitchel E. Schultz, 10th edition, Tata McGraw Hill
6. Principle of Electronics by V. K. Meheta&Rohit Mehta, S.Chand& Company Ltd
7. Electronic Device & Circuit Theory by Robert L. Boylestad& Louis Nashelsky Pearson Publication

Reference Books:

5. Electronics Devices and Circuits by David A. Bell, Oxford University Press.
6. Electronic device and circuit by S. Salivahanan.

Basic Electronics Lab

Subject Name	Code	Type of course	T-P-P Credit	Prerequisite
Basic Electronics Lab	DIFC0206	Practical	2	-

1. Objective

- To provide students engineering skills by way of breadboard circuit design with electronic devices and components.
- To design and analyze various Electronic circuits such as amplifiers, applications of audio amplifiers, voltage regulators etc. so that students are able to understand the practical aspects of basic electronics theory.

2. Learning outcome

- Analyze Electronic Circuit
- Design small, large signal amplifier circuits for various practical applications
- Design, fabricate and test small electronic circuit.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Experiments	40	Written & Hands on Practice
	Project	10	Report and Presentation
External Examination		50	Written & Hands on
Total		100	

4. Course Contents

Sl. No	Topics	Periods(hrs)
1	Familiarization with Laboratory Instruments (Oscilloscope, Function Generator, DC Power Supply, Breadboard)	3
2	Measuring Instruments: How to use?	3
3	Testing of Passive Electronic Components	3
4	Testing of Active Electronic Components	3
5	Design & Implementing Voltage regulator using Zener diode	3
6	Design & Implementing Voltage Regulation using LM723, LM334	3
7	Design & Implementing Amplifying Circuits (Audio Amplifier) using BJT & FET	3
8.	Design & Implementing Switching Circuits using relay and Transistor (BJT)	3
9.	Sensor Designing	3
10	Design & Implementing transistor as an Oscillator.	3
11.	Project: Designing a Woofer/Power Bank / any other	12
Total		42

Basic Electrical

Subject Name	Code	Type of course	T-P-P Credit	Prerequisite
Basic Electrical	DIFC0109	Theory	3	

1. Objective

- To identify the important electrical components, understand their operation and application.
- To understand the operation, designing, and application of important electrical circuits for device level application.
- To realize the industrial applications associated to electrical engineering.

2. Learning outcome

- Knowledge of the current pattern of designing an electrical application
- Knowledge of the evolving areas and strategies in electrical applications

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	20	Written examination
	Assignment	10	Report and Presentation
External Examination		70	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Recent Trends in Electrical Engineering: an Overview	3
2	Introduction to Electrical Engineering	6
3	DC Networks	6
4	Introduction to Electromagnetism	4
5	Single-Phase AC Circuits	6
6	Three-Phase AC Circuits	6
7	Domestic Wiring	7
8	Electrical Equipment's	12
Total		50

5. Course Contents

Module I

Recent Trends in Electrical Engineering: an Overview

Wireless Power Transfer, Large Capacity Batteries, Smart Grid System, Electric Vehicles, Energy Harvesting, Smart Energy Producing Buildings, SCADA.

Introduction to Electrical Engineering

Essence of electricity, Electric field; electric current, potential and potential difference, emf, electric power, ohm's law, basic circuit components, Ideal and Practical Sources, Source Conversion, Induced EMF, Energy Stored in Inductor & Capacitor

DC Networks

Laws and Theorems applicable to DC networks (KCL & KVL, Node voltage & Mesh current analysis, Delta-Star & Star-Delta conversion, Superposition principle, Thevenin's & Norton theorem).

Module II

Introduction to Electromagnetism:

B-H curve, Permeability, Reluctance, Simple magnetic circuits, Hysteresis and Eddy current loss. Methods of preventing such losses. Working principle and application of Solenoids, Contactor, Relay.

Single-Phase AC Circuits

Single-phase EMF Generation, Waveform and Phasor Representation, Average and Effective value of sinusoids, Peak factor & Form factor, Power factor.

Three-Phase AC Circuits

Comparison between single-phase and three-phase systems, Three-phase EMF Generation, Line and Phase quantities in star and delta networks, Power and its measurement in three-phase balanced circuits.

Module III

Domestic Wiring

Distinguish between series & parallel connection, Use of regulators (Variable Resistor, Rheostat, Variac), Working and Specification of Fuses and MCBs, Calculation of energy consumption of domestic applications, AC Household wiring with earthing connection and its importance.

Electrical Equipment's

Transformer: Familiarization, description of parts, Transformation ratio, Ideal transformer, Step-up and Step-down transformers and their connection diagram. Losses in Transformer (Copper Loss, Iron Loss) and its efficiency formula.

Motors: Familiarization, Types of motors, Principle of operation (ac and dc motor), Calculation of load consumption of motors (load current , armature current, field current).

Alternator and Generator: Difference between Alternator and Generator, Dissect & Re-Construct a DC generator & Alternator

B. Reference

E-content:

<http://www.nptelvideos.in/2012/11/basic-electrical-prof-tsnatarajan.html>

<http://nptel.ac.in/courses/112108092/37>

<http://nptel.ac.in/downloads/108105053/>

<http://nptel.ac.in/courses/117106108/>

Text Books:

1. Basic Electrical Technology by VK Mehta
2. Basic Electricity' vols 1 - 5 by M.E Van Valkenburgh

Reference Books:

1. Basic Electrical Engineering by T.K. Nagsarkar (Author), M.S. Sukhija (Author)

Basic Electrical Lab

Subject Name	Code	Type of course	T-P-P credit	Prerequisite
Basic Electrical Lab	DIFC0207	Practical	2	

1. Objective

- To apply and understand the utility of principles, laws and theorems in Electrical engineering
- To realize the operation, application of important electrical circuits and applications

2. Learning outcome

- To develop the skill of testing and designing the architecture of circuits/network for electrical systems for domestic and industrial applications
- Understanding the concept behind electrical wiring.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Experiments	40	Written & Hands on Practice
	Project	10	Report and Presentation
External Examination		50	Written & Hands on
Total		100	

4. Course Contents

Sl. No	Topics	Periods
1	Visit to electrical installation set ups in campus (different Labs, Workshops,	3

	Power house)	
2	Verification of KCL and KVL in series and parallel circuits.	3
3	Verification of Thevenin's theorem, Superposition and Nodal analysis (by experimental setup)	3
4	Plotting the V-I Characteristics of incandescent lamp.	3
5	Connection and Measurement of power consumption of a fluorescent lamp.	3
6	Demonstration on Earthing connection.	3
7	Starting of single phase induction motor with capacitor.	3
8.	Starting of 3-phase induction motor using DOL, star and delta connection.	3
9.	Load calculation and validation on alternator set.	3
10	Installation of Switch Boards and Distribution boxes	3
11.	Installation of electrical Panel of a conventional Lathe Machine with the help of OLR, MCB, contactors and push button switches (condition: the three phase motor should move forward and reverse with emergency stop)	12
Total		42

Computer Aided Drafting

Subject Name	Code	Type of course	T-P-P Credit	Prerequisite
Computer Aided Drafting	DIFC0208	Practice	3	

1. Objective

- Understand the importance of engineering drafting
- Understand the uses of software (AutoCAD) in engineering drafting
- Become well acquainted to the Auto-CAD platform for drafting applications

2. Learning outcome

- Knowledge of the different pattern industrial drawing.
- Develop skill of component designing and assemble in software platform
- Model making using Auto-CAD

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Assignments	50	Hands on Practice
External Examination		50	Project Assignment
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods(hrs)
1.	Scaling and Dimensioning Unit and Dimensions: Lines, Circle , Arc	03
2	Orthogonal Projection of Objects Axis, Plane, Types of Projection, Shape	03
3	Isometric View Draw isometric view & isometric projection of prism, pyramid, cone & cylinder with axis horizontal & vertical with construction of isometric scales.	05
4	Model Making 3 BHK building with parking & front lawn (Civil) Universal Coupling & Cut section of IC Engine (Mech.) Cotter joint & knuckle joint (Mech.)	05
5	Practice the CAD Platform (Auto CAD)	74
Total		90

5. Course Contents

Module I

Scaling and Dimensioning

Unit and Dimensions:

- Any Object surrounds him to be measure (e.g. - Black board length, duster, table, drawing sheet).
- Unit and dimensions conversion (use C.G.S, M.K.S, S.I)

Lines

- Various types of lines (Detail explanation of different of lines uses in drawing Eg. Straight line, dotted line, axis lineEtc)

Circle

- Various types of lines (Details explanation of half circle ,full circle, and different angle of circle)

Arc

- Various types of arcs

Assignment:- 1(Create a shape using line command ,ex-(rectangular, square , trapezium,.....etc)

Assignment:2- (Create a shape using circle command ,ex-(circle ,half circle ,angle circle ...etc)

Orthogonal Projection of Objects

Axis- x , y , z. detail explanation of all the axis (important of axis in plane)

Plane- xy , yz , zx

Types of Projection- 1st & 3rd angle projection, Explain why we are not using 2nd & 4th projection.

Shape- projection of hexagonal, pentagonal, rectangular object in 1st and 3rd degree angle of projection

Assignment: - 3(Draw and project 1st angle of projection of different shape ex. hexagonal, pentagonal...etc)



Assignment: - 4 (Draw and project 3rd angle of projection of different shape ex. hexagonal, pentagonal...etc)

Module II

Isometric View

- Draw isometric view & isometric projection of prism, pyramid, cone& cylinder with axis horizontal & vertical with construction of isometric scales.

Assignment:-5 (Draw isometric view prism, pyramid, cone& cylinderetc)

Model Making

- 3 BHK building with parking & front lawn (Civil)
- Universal Coupling& Cut section of IC Engine (Mech)
- Cotter joint & knuckle joint...etc (Mech)

Assignment:- 6 (model making of universal joint)

Assignment:-7 (model making of universal cotter joint)

Assignment-8 (model making of knuckle joint)

Module III

CAD (3D)

- Introduction to CAD
- Understanding co-ordinate system
- Getting started with AutoCAD
- Starting with line diagram
- Basic object creation & modification
- Polyline & spline
- Object creation / Drawing Utilities
- Introduction to Dimension
- Productivity tool
- Plotting
- Getting started with 3D
- UCS & view point
- Solid modeling & modifiers
- Edit solid model & base view creation.

Assignment:- 9 (Drawing of spanner with 2d and 3d)

Assignment -10 (Drawing of screw jack by using 2d and 3d)

Assignment -11 (Drawing universal coupling by using 2d and 3d)

Assignment -12 (Drawing of engine component's parts with 2d and 3d)

Assignment -13 (Drawing of machine components parts with 2d and 3d)

C. Reference

E-content: *E-content:* <http://tutorial45.com/autocad-exercise-01/>

<http://www.computeraideddesignguide.com/autocad-exercises/>

Text Books:

8. Machine Drawing (N.D.Bhatt)
9. Geometric Machine Drawing (N.D.Bhatt , V.N.Panchal)

Reference Books: Engineering drawing (N.D. BHATT)

Computer Aided Designing (Electrical Engineering)

Subject Name	Code	Type of course	T-P-P Credit	Prerequisite
Computer Aided Designing (Electrical Engineering)	DIFC0211	Practice	3	

1. Objective

- To make student analyze the electrical system through computer simulation using software packages (AutoCAD, Solid Works)

2. Learning outcome

- Students should able to create an electrical wiring diagram by using AutoCAD software.
- Enabling students to visualize different Electrical design
-

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	40	Skill test and Written test
	Assignment	10	Report
External Examination		50	Skill test and Written test
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Introduction to AutoCAD Electrical: Drawing Files & Wires	3
2	Design of Electrical symbols(take print out)	9
3	Design of Transformer parts (take print out)	12
4	Design of D.C. m/c parts (take print out)	12
5	Design of winding diagrams (take print out)	12
6	Draw electrical layout of diagram of Electrical Installation of a building.	12
7	Layout of distribution substation (take print out)	15
Total		75

5. Course Contents

- Introduction To AutoCAD Electrical:** Drawing Files & Wires
- Design Of Electrical Symbols(Take Print Out):**
 Assignment 1:Resistor,Potentiometer,
 Assignment 2:Trnsformer,Inductor,Inductor With Tapping , Inductor With Core,,
 Assignment 3:Coneccting Right Plug, Connecting Left ,Plug, Socket, Clamp,
 Assignment 4:Connector,Fuse,Permanent Magnet,

- **Design Of Transformer Parts (Take Print Out):**
 - Assignment 5: Design Of Buchholz Relay Contraction
 - Assignment 6: Design Of Conservator Tank
 - Assignment 7: Design Of Pressure Relasing Valve
 - Assignment 8: Design Of Breather
- **Design Of D.C. M/C Parts (Take Print Out):**
 - Assignment 9: Stator
 - Assignment 10: Pole Shoe
 - Assignment 11: Armature
 - Assignment 12: Commentator
- **Design Of Winding Diagrams (Take Print Out):**
 - Assignment 13: Lap Winding
 - Assignment 14: Wave Winding
- **Draw Electrical Layout Diagram Of Electrical Installation Of A Building**
 - Assignment 15: Single Room Building
 - Assignment 16: 2 Bhk Building
- **Layout of Distribution Substation**
 - Assignment 17: **Single Line Design Of A 11/0.4 Kv Distribution Substation**
 - Assignment 18: **Single Line Design Of A 11/3 Kv Distribution Substation**

7. Reference

E-content:

- 1) <https://i2.wp.com/www.linecad.com/wp-content/uploads/2017/07/cad-electrical-symbols.png?ssl=1>
- 2) <http://electrical-engineering-portal.com/protecting-oil-type-transformer-with-buchholz-relay>
- 3) <http://cathology.info/electrical-drawing-for-house-in-autocad/>

Text Books:

1. AutoCAD Electrical 2018 Black Book by Gourav Verma, Matt Weber
2. Solidworks Electrical 2017 Black Book by Gourav Verma, Matt Weber

Computer Aided Designing (Automobile Engineering)

Subject Name	Code	Type of course	T-P-P Credit	Prerequisite
Computer Aided Designing (Automobile Engineering)	DIFC0212	Practice	3	

1. Objective

- To offer a clear overview of the recent trend in 3d modeling.
- To be familiar with the 3d modeling tools, interfaces and process of producing accurate designs.

2. Learning outcome

- Knowledge about designing techniques and processes of different automotive components.
- Skill of testing, designing and improving the automobile design.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	40	Skill test and written test
	project	10	Skill test
External Examination		50	Skill test and written test
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics (all in 3D)	Periods
2	Design of basic yet useful things	9
2	Design of standard equipment	9
3	Design of small auto components	9
4	Design of shock absorber parts and assembly	9
5	Design of universal joint parts and assembly	9
6	Design of constant mesh gear box assembly	9
7	Design of a alloy wheel of a bike and a car	12
8	Design of single cylinder IC engine assembly with simulation	12
9	Design of car chassis and frame	12
	Total	90

5. Course Contents

Design of basic yet useful things

- Assignment 1 :Pot (Flexible Size)
- Assignment 2 :Plate (Flexible Size)
- Assignment 3: Corrugated Sheet (Flexible Size)
- Assignment 4: Knife (Flexible Size)
- Assignment 5:Wrist Band (Flexible Size)

Design of standard equipments

- Assignment 6: Cold Drinks Bottle (Flexible Size)
- Assignment 7: Mobile Back Cover. (Flexible Size)
- Assignment 8: Cricket Bat (Standard Size)
- Assignment 9: Wayfarer Goggles (Standard Size)

Design of small auto components

- Assignment 10: U Clamp With Nut And Bolt (Standard Size)
- Assignment 11: O Ring , Piston Ring (Standard Size)
- Assignment 12: Gasket (Standard Size)
- Assignment 13: Car Front Grill (Standard Size)
- Assignment 14: Ball Bearings
- Assignment 15: Design Of Shock Absorber Parts And Assembly (Standard Size)
- Assignment 16: Design Of Universal Joint Parts And Assembly (Standard Size)
- Assignment 17: Design Of Constant Mesh Gear Box Assembly (Standard Size)
- Assignment 18: Design Of A Alloy Wheel Of A Bike And A Car (Standard Size)
- Assignment 19: Design Of Single Cylinder IC Engine Assembly With Simulation (Standard Size)
- Assignment 20: Design Of Car Chassis And Frame (Standard Size) .

D. Reference

E-content:

1. <https://www.youtube.com/watch?v=LEQDbxkxEoA>
2. <http://www.nptelvideos.in/2012/11/basic-electronics-prof-tsatarajan.html>

Text Books:

3. CATIA V5-6R2013 for Designers Author: Sham Tickoo
4. CATIA Manual and practice book (cutm)

Reference Books:

5. CATIA manual and practice book(cutm)
6. CATIA Core Tools Author: Michel Michaud

Computer Aided Designing (Mechanical Engineering)

Subject Name	Code	Type of course	T-P-P Credit	Prerequisite
Computer Aided Designing (Mechanical Engineering)	DIFC0213	Practice	3	

1. Objective

- To offer a clear overview of the recent trend in 3d modeling and 3d modeling techniques of different components used in day to day life as well as in the field of mechanical engineering.
- To identify the importance of 3d modeling in engineering.

2. Learning outcome

- Knowledge about designing techniques and processes of making different components/parts, machines as well as drafts.
- Skill of testing, designing and improving the component and assembly design.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	40	Skill test and written test
	project	10	Skill test
External Examination		50	Skill test and written test
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics (all in 3D)	Periods
2	Design of basic yet useful things	3
2	Design of standard equipment's	9
3	Design of tools	9
4	Design of knuckle joint parts and assembly	9
5	Design of hooks joint parts and assembly	9
6	Design of bolt and nut assembly with simulation	9
7	Design of a bench vice assembly	15
8	Design of single cylinder IC engine assembly with simulation	15
9	Design of lathe machine tailstock assembly	15
	Total	90

5. Course Contents

Design of Basic yet useful things:

Assignment 1: Pot – Cylindrical, Conical, Box Type (Flexible Size)

Assignment 2: Plate –Circular Rectangular(Flexible Size)

Assignment 3: Corrugated Sheet – Wave , Square, Trapezoidal(Flexible Size)

Assignment 4: Knife (Flexible Size)

Assignment 5: Wrist Band (Flexible Size)

Design of Standard Equipment's:

Assignment 6: Cold Drinks Bottle (Flexible Size)

Assignment 7: Mobile Back Cover. (Flexible Size)

Assignment 8: Cricket Bat (Standard Size)

Assignment 9: wayfarer goggles (standard size)

Design of Tools:

Assignment 10: Lathe Tool- Grooving, Boring, Turning, Knurling(Standard Size)

Assignment 11: Shaper Tool (Standard Size)

Assignment 12: End Mill Cutter (Standard Size)

Assignment 13: Face Mill Cutter (Standard Size)

Assignment 14: Design Of Knuckle Joint Parts And Assembly (Standard Size)

Assignment 15: Design Of Hooks Joint Parts And Assembly (Standard Size)

Assignment 16: Design Of Bolt And Nut Assembly With Simulation (Standard Size)

Assignment 17: Design Of A Bench Vice Assembly (Standard Size)

Assignment 18: Design Of Single Cylinder IC Engine Assembly With Simulation (Standard Size)

Assignment 19: Design Of Lathe Machine Tailstock Assembly / Design Of Car Chassis(Standard Size)

E. Reference

E-content:

- <https://www.youtube.com/watch?v=LEQDbxkxEoA>
- <http://www.nptelvideos.in/2012/11/basic-electronics-prof-ts-natarajan.html>

Text Books:

6. CATIA V5-6R2013 for Designers Author: Sham Tickoo

7. CATIA Manual

Reference Books:

1. CATIA manual
2. CATIA Core Tools Author: Michel Michaud

Computer Aided Designing (Mining Engineering

Subject Name	Code	Type of course	T-P-P Credit	Prerequisite
Computer Aided Designing (Mining Engineering)	DIFC0214	Practice	3	

1. Objective

- To identify the importance of 3D modeling in field of mining
- To make student analyze the Open cast and underground mine system through 3d modeling using software packages(AutoCAD)

2. Learning outcome

- Students should able to design the layout of open cast & underground mine.
- Students will be able to provide optimize design structure for underground mines.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	40	Skill test and Written test
	Assignment	10	Report
External Examination		50	Skill test and Written test
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Introduction to AutoCAD, Drawing tools and tool bars	12
2	Surface contouring using the survey data	18
3	Preparing 3d model of an open cast mine	24
4	Preparing 3d model of an underground mine	36
Total		90

5. Course Contents

- **Introduction to AutoCAD:** Exposure to drawing Tools and Tool bar
- **Surface Contouring using the Survey Data**
 Assignment 1:Contouting of A Flat Rectangular Field
 Assignment 2: Contouring of A Flat Non Uniform Field
 Assignment 3: Contouring of A Non Uniform Hill Area Rectangular Field
 Assignment 4: Contouring of A Non Uniform Hill Area Non Uniform Field
- **Preparing 3d Model of an Open Cast Mine:**
 Assignment 5: Design of Belt Conveyor System
 Assignment 6: Design of Long Wall Retreating System
 Assignment 7: Design of Long Wall Advancing System
 Assignment 8: Design of Tube Rail System
- **Preparing 3d Model of an Underground Mine:**
 Assignment 9: Design of Roof And Side Stitching In Underground Mines

Assignment 10: Design of Junction And Support System

Assignment 11: Design of Roof Bolting System

Assignment 12: Design of Depillaring In A Board And Pillar Plane

Assignment 13: Design of Board And Pillar Development Working

Assignment 14: Design of Room And Pillar Method Of Underground Mine

Assignment 15: Design of Long Wall Method Of Underground Coal Mine

7. Reference

E-content:

6. <https://i2.wp.com/www.linecad.com/wp-content/uploads/2017/07/cad-electrical-symbols.png?ssl=1>
7. <http://electrical-engineering-portal.com/protecting-oil-type-transformer-with-buchholz-relay>
8. <http://cathology.info/electrical-drawing-for-house-in-autocad/>

Text Books:

Mastering AutoCAD 2016 and AutoCAD LT 2016: Autodesk Official Press

Computer Aided Designing (Civil Engineering)

Subject Name	Code	Type of course	T-P-P Credit	Prerequisite
Computer Aided Designing (Civil Engineering)	DIFC0215	Practice	3	

1. Objective

- To teach users the basic commands and tools necessary for professional 2D drawing
- Enabling students to design 3D models for smart infrastructure
-

2. Learning outcome

- Create multiple designs using several of tools.
- Create layers to control the objects' visibility.
- Explain drawing using annotations.
- Plot or print the drawing by scale.
- To use constraint for certain design.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Midterm Test	40	Skill test and Written test
	Assignment	10	Report
External Examination		50	Skill test and Written test
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Introduction to AutoCAD, Drawing tools and tool bars	6
2	Surface contouring using the survey data	15
3	Preparing 3d model of a open cast mine	18
4	Preparing 3d model of a underground mine	18
Total		75

5. Course Contents

- **Introduction To Autocad Electrical, Drawing Files & Wires**
- **2. Surface Contouring Using The Survey Data**
 Assignment 1: Contouring Of A Flat Rectangular Field
 Assignment 2: Contouring Of A Flat Non Uniform Field
 Assignment 3: Contouring Of A Non Uniform Hill Area Rectangular Field
 Assignment 4: Contouring Of A Non Uniform Hill Area Non Uniform Field
- **3. Preparing 3d Model Of A Open Cast Mine:**
 Assignment 5: Design Of Belt Conveyor System
 Assignment 6: Design Of Long Wall Retreating System
 Assignment 7: Design Of Long Wall Advancing System
 Assignment 8: Design Of Tube Rail System
- **4. Preparing 3d Model Of A Underground Mine:**
 Assignment 9: Design Of Roof And Side Stitching In Underground Mines
 Assignment 10: Design Of Junction And Support System
 Assignment 11: Design Of Roof Bolting System
 Assignment 12: Design Of Depillaring In A Board And Pillar Plane
 Assignment 13: Design Of Board And Pillar Development Working
 Assignment 14: Design Of Room And Pillar Method Of Underground Mine
 Assignment 15: Design Of Long Wall Method Of Underground Coal Mine

7. Reference

E-content:

- 4) <https://i2.wp.com/www.linecad.com/wp-content/uploads/2017/07/cad-electrical-symbols.png?ssl=1>
- 5) <http://electrical-engineering-portal.com/protecting-oil-type-transformer-with-buchholz-relay>
- 6) <http://cathology.info/electrical-drawing-for-house-in-autocad/>

Text Books: Mastering AutoCAD 2016 and AutoCAD LT 2016: Autodesk Official Press

Mechanical Workshop Practice

Subject Name	Code	Type of course	T-P-P	Prerequisite
Mechanical Workshop Practice	DIFC0209	Practical	3	

1. Objective

- Utilizing different tools, mechanisms, measuring instruments with safety
- Linking the Specific tools with their specific applications towards different process.
- Conveyance on cutting, joining, machining & assembly processes in manufacturing

2. Learning outcome

- Knowledge on safety of tools and processes to avoid accident.
- Skills of using different power and machine tools.
- Exposure to using different metal cutting, fitting & joining processes.

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Experiments	40	Lab work, report
	Quiz (viva)	10	Surprise/preannounced ones
External Examination		50	Viva
Total		100	

5. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Approach to mechanical establishment & illustration to safety practice & equipment	9
2	Fitting shop.	15
3	Wood Engineering/ sheet metal work	15
4	Welding	21
5	Power tools and Machine tools	30
	Total	90

4. Course Contents

Assignment 1: Finding types, specification, basic working of clamping devices & tools from different resources

Assignment 2: Searching various latest measuring technology with quick working process from different sources

Assignment 3: Reference profile production from (50*50*12) mm MS-slab.

Assignment 4: Filling of previous job to make it (45*45*10)mm. slab, hacksawing, punching

Assignment 5: Sheet metal tray formation (150*150*2) mm./ Cabinet making wood lab using dovetail joint.

Assignment 6: V-joining process by using previous fitting shop job and 45*30*5 mm new MS- slab.

Assignment 7: Repairing of old damaged metal scraps by using gas welding process

Assignment 8: Profile cutting and fitting cylindrical work piece with fitting shop job.

Assignment 9: Profile cutting and fitting cylindrical work piece

Assignment 10: Profile cutting and fitting cylindrical work piece with fitting shop job.

Computer Application Lab.

Subject Name	Code	Type of course	T-P-P Credit	Prerequisite
Computer Application Lab.	DIFC0208	Practical	3	

1. Objective

- To make them enable to work effectively with a range of current, standard, Office Productivity software applications
- Evaluate, select and use office productivity software appropriate to a given situation.

2. Learning outcome

- Students will demonstrate the ability to produce a technical document.
- Apply knowledge of computing and information technologies to produce effective designs and solutions for specific computer-based problems;

3. Evaluation System

Internal Examination	Component	% of Marks	Method of Assessment
	Experiments	40	Lab Performance
	Quiz (viva)	10	Assignment
External Examination		50	Written examination
Total		100	

4. Topic Wise Distribution of Periods

Sl. No	Topics	Periods
1	Basic Computer Concept	15
2	Office Package (MS Office 2007/2010)	24
3	Internet & and its applications	15
4	Adobe Photoshop	20
5	PC assembly and maintenance	15
Total		90

5. Course Contents

Module-I

Basic Computer Concept:

- Application of Computer in real life & various components of desktop.
- Brief introduction to CPU/input & output device.
- Hardware & Software.

Typing Course:

- Typing Tutorial in standard QWERTY keypad.
- Trainee will learn the positions of the letters with all keys / numbers & special characters by using formulas (using ten fingers).
- Mathematical symbols and num key pad with typing lesson.

Module-II

MS office Package : [2007/2010]:

- Create documents using word pad/ notepad with information like name, qualification, address, date of birth will all formatting (changing font size, make the font italic/ bold/ heading and alignment of text.
- Creating document in notepad.
- Lesson procedure for creating, naming, renaming of a file and folder. Properties of a file and folder (change icon, hiding & changing the attributes).

Applications of utilities in Windows:

- Open notepad, Paint, Word Pad, Command prompt and other frequently used application using run command.
- Create shortcut, auto-hide, task bar, changing desktop backgrounds and themes.
- Extension names of the files (like Word, Paint, Power point, image, etc)

MS Office Package:

- Learn to create a document in ms word and compare the difference between word/ word pad and notepad.

MS Word:

- Creating word document (CV/ Resume), compare the basic difference and efficiency of word in contrast to Notepad, Word pad.
-
- Inserting Background text and water mark images.
- Inserting cliparts and images by browsing from different place, use the wrap properties to place the image in desired place.
- Insert bullet and numbering, steps to apply Border and shading to the document, Alignment properties.
- Insert page number. (Know about header and footer)
- search a character or word using find and replace a word or phrase using replace.
- Steps to insert symbol, mathematical symbol, equations, special characters.
- Steps to create a table, add column, add row, delete a row, delete a column, delete a table, change the table border, draw table using draw table window. Inserting data to the table and cell alignment, split cell, merge cell.

MS Excel

- Open MsExcell, insert sheet, hide sheet, change color of sheet tab, tab rename.

- Know about rows and column, identifying a cell.
- Apply border to cell and sheet, change border width format, change border color, merge and un-merge the cell, change the format of a cell (the format of the value that will be placed in the cell like: number/ text/ currency,etc).
- insert logos and picture in excel sheet, page layout.
- Use mathematical and logical functions available in excel.
- Insert rows, column, and short keys to insert them, delete a column, row, changing row or column size make all the row of same width.
- Changing the cell color, applying various format to the sheet prepared.
- Create various document to calculate the grade after entering marks of a student.
- Prepare a salary slip.
- Prepare an excel sheet containing the salary structure with calculation of DA, HRA, PF, GROSS salary and Net salary of each employee(fro 50 employees).
- Prepare a sheet containing the student information (name, regd. Number, address, Contact info of 50 students

MS Powerpoint:

- Create a presentation of daily activities.
- Creating a presentation containing a company details with pictures and logo.
- Creating a presentation describing a technology with diagrams, pictures, charts.
- Create a presentation of a product that includes pictures and hyperlinks, applying customanimation, slide transition effects, and formatting the pictures, resize and arrange them.

MS Access:

- Creating a simple database containing the student information and employee details.
- Use of primary key.
- Get familiarize with data base and its various operations

Internet and its applications:

- Know about the URL, browsers, domain name.
- Address bar and home button, clearing history.
- Steps to create a email, sending mail, attaching a file(document, pictures, etc.), drafts, use and advantage of Google drive.
- Searching and create a presentation about the historical places of a region or India.
- Send mails including files, folders. And attaching large files through mail.

Module-III

Adobe Photoshop:

- Use of Photoshop in the professional field.

- Know about the various tools.
- Simple techniques like resize, cropping, changing background, erasing background putting other background to an existing image, clearing and image, adjusting the lights, blending options, inserting text to the image, knowledge about layers. Delete a layer, switching between layers, saving the files and the extensions available (psd, pdf, tif, png, jpeg, etc.)
- creating gif (animated) image files.

PC assembly and maintenance:

- Knowing various hardware parts present in the CPU cabinet by opening it.
- De-assemble and reassemble the PC parts.
- View the BIOS screen changing the boot order (Hard disk, CD or Flash Drive)
- Disk defragment process.
- Use System restore and safe mode when PC goes under minor problems.
- Disk checking and fixing.
- Utilities like backup, format, recover deleted files.
- Know about the firewall (internal, external) and Antivirus

F. Reference

E-content:

<http://www.instructables.com/id/Basic-Electronics/>

<http://www.nptelvideos.in/2012/11/basic-electronics-prof-ts-natarajan.html>

<http://nptel.ac.in/courses/112108092/37>

Text Books:

6. Grob's Basic Electronics by Mitchel E. Schultz, 10th edition, Tata McGraw Hill
7. Principle of Electronics by V. K. Meheta&Rohit Mehta, S.Chand& Company Ltd
8. Electronic Device & Circuit Theory by Robert L. Boylestad& Louis Nashelsky Pearson Publication

Reference Books:

7. Electronics Devices and Circuits by David A. Bell, Oxford University Press.
8. Electronic device and circuit by S. Salivahanan.