

SCHOOL OF DIPLOMA STUDIES	PROGRAM: DIPLOMA – ELECTRICAL ENGINEERING
ACADEMIC YEAR - 2018-19	SEMESTER – I BATCH YEAR: 2018-21
DEFINITION OF ONE CREDIT: 1. Lecture(L): 1 hour / week / semester, 2. Practical(P): 2 hour / week / semester 3. Tutorial(T): 2 hour / week / semester	

Course Code	Course Name	Teaching Hours			Credits	Audit course	CIE	PSEE
		Theory	Tutorial	Practical				
DGN109	MATHEMATICS-I	4	0	0	4	N	Y	N
DGN105	APPLIED SCIENCE	3	0	2	4	N	Y	Y
DEE109	FUNDAMENTAL OF DC CIRCUITS	3	2	2	5	N	Y	Y
DCE103	COMPUTER APPLICATIONS	0	0	4	2	N	Y	Y
DEE107	ELECTRICAL WORKSHOP	0	0	4	2	N	Y	Y
ESL102	ENGLISH AS A SECOND LANGUAGE, Beginners Level 1	3	0	0	3	N	Y	N
	Mentoring	1	0	0	0	N	N	N
	ELECTIVE: I	0	0	1	1	N	N	Y
NSS101	NSS-I #							
YOG101	YOGA -I#							
	Total	14	2	13	21			
		Total Hours		29				

Students are required to undergo 15 hours training / field visit/ workshop in relevant field during semester.

N- No	CIE – Continuous internal evaluation
Y – Yes	PSEE – Practical semester end examination including ITD, Dissertation, Industrial project, Industrial training etc...

Course Title	COMPUTER APPLICATIONS	
Course Code	DCE103	
Course Credit	Lecture	: 0
	Practical	: 2
	Tutorial	: 0
	Total	: 2
Course Objective		
<p>Computer Application includes the topics such as computer peripherals, storage devices, computer networking, system analysis and design and also includes advance technology like laptop, smart phone and also tablet. In the software part Computer Application has all basic knowledge about system software, applications, software programming language, operating system, Microsoft office and photo editing & animations software.</p>		
Detailed Syllabus		
Module No.	Topics	No. of Sessions
Section – A		
1	Introduction to various hardware and software devices Hardware: Monitor, Mouse, Keyboard, CPU, Printer & Scanner etc... Software: Notepad, WordPad, MS paint and freeware softwares like Open Office, Skype etc...	4
2	Connecting various peripheral devices to CPU Demo of Connecting all the peripherals with the CPU	4
3	Showing the internal components of CPU Assembling various components like RAM, SMPS, Hard disk with Mother board.	2
4	Operating system basic Hard disk: Formatting, Partition, Defragmentation. Installation of LINUX and Windows 7 OS, Installation of Application software.	6
5	Learning basics of photo editing Improve your photographs, Maximize images for web and print, Build image collages, Develop creative projects with Photo editing software painting and drawing tools.	12
Section – B		
6	Learning basics of Animation Animation: Create frame, layers and folder, use of tools, use of colors and	10

	symbols. Basics of Animation: Moving Line, Bouncing Ball	
7	Overview of Android How to use basic Apps in Android phone.	2
8	Basics of Programming using C Language Introduction to concepts of programming Writing simple c programs, printing something in screen. Data types and variables- int, float, char, string etc.... Operators and expressions- arithmetic operators, logical operators, increment and decrement operators and assignment operators. Control Structures: conditional statements and looping statements.	16

Reference Books:

1. Programming in ANSI 'C' By Balagurusamy TMH Publications
2. Computer Fundamental, Author: P.K. Sinha, BPB Publications
3. Macromedia Flash8 Bible, Robert Reinhardt, Snow Dowd Wiley Publications
4. Adobe Photoshop CS6 Bible, Lisa Danae , Brad Dayley Wiley Publications

List of experiments:

1. Connecting various computer peripherals.
2. Connect RAM, SMPS and Hard disk on Motherboard.
3. Make partition of Hard disk and install the Operating System.
4. Perform defragmentation of partitioned drive and find the bad sector.
5. Photo Editing - Practice of the following tools
 - a. Crop tool
 - b. Move tool
 - c. Marquee tool
 - d. Slice tool
 - e. Magic wand tool
 - f. Layers
 - g. Healing brush tool
 - h. Colors
6. Animation – Practice of following tools
 - a. Layers and folders
 - b. Frames and Key frames
 - c. Tools and its properties
 - d. Views
 - e. Colors
 - f. Symbols
 - g. Motion Guide
7. Programming using C
 - a. Write a program to print a “hello world”.
 - b. Write a program to declare a variable and print its value.

- c. Write a program to add two numbers.
- d. Write a program to subtract two numbers.
- e. Write a program to multiply two numbers.
- f. Write a program to divide two numbers.
- g. Write a program to find the remainder when a number is divided by other.
- h. Write a program to find average of 10 numbers.
- i. Write a program to find simple interest.
- j. Write a program to find area of circle.
- k. Write a program to find maximum number among three numbers.
- l. Write a program to find minimum number among three numbers.
- m. Write a program to find whether a given year is leap year or not.
- n. Write a program to find whether the number entered by user is odd or even.
- o. Write a program to find whether the number entered by user is positive negative or zero.
- p. Write a program to find whether entered number is odd or even number
- q. Write a program to input gender and salary of an employee and check whether salary of an employee is taxable or not. (salary limit for male 2,00000 and female 1,80000).
- r. Write a program to make a calculator using switch case statement.
- s. Write a program to input any character and check whether it is a number, char or special symbol.
- t. Write a program to display day name in character according to input day number using switch case statement.

Course Title	ELECTRICAL WORKSHOP
Course Code	DEE107
Course Credit	Lecture : 0
	Practical : 2
	Tutorial : 0
	Total : 2

Course Learning Outcomes

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

- **Use** various electrical tools and measuring instruments.
- **Identify** different types of wires, cables, light sources, switches, resistors and capacitors.
- **Replicate** soldering techniques.
- **Execution** of different control circuit components.
- **Perform** different types of domestic wirings.

Detailed Syllabus

Module No.	Topics	No. of Sessions
SECTION-I		
1	Electrical Tools and Accessories. Pliers, nose pliers, cutter, screw driver, tester, test lamp etc. Ammeter, voltmeter, wattmeter, clip on meter, Multimeter, Megger, etc.	8
2	Cables wire and Switches. Single core cable, multi core cable, single strand wire, multi strand wire, shielded wire, different types of light sources etc.; Toggle switch, Rotary switch, Push button switch, micro switch, MCB, ELCB, etc.	10
3	Resistors and Capacitors Rheostat, wire wound resistor, Carbon film resistor, Carbon composition resistor, fixed and variable potentiometer etc. Paper capacitor, electrolytic capacitor, ceramic capacitor, polyester, gang capacitor	10
SECTION-II		
4	Control circuit components and simple control circuits. Usage of different control circuit components, realization of simple control circuits like DOL starter, Forward reverse operation of motor.	10
5	PCBs and Soldering Introduction to PCB, Process of PCB design and manufacturing, Introduction, soldering, different soldering tools, techniques of error free soldering	10

6	Earthing and Electrical Safety Earthing, pipe earthing, plate earthing, Electrical safety tools Electrical safety rules, I.E. rules for electrical hazards and accidents	8
----------	--	----------

Reference Books:

1. Electrical Wiring, Estimating & Costing by S. L. Uppal, Khanna Publisher.
2. Study of Electrical Appliances and Devices by K.B.Bhatia, Khanna Publisher.
3. Electrical Estimating & Costing by Surjit Singh, Dhanpat Rai & Co. Publication.

List of experiments:

1. Identify various tools used for wiring
2. Identify the symbols used in electrical circuit diagrams.
3. Identify and connect various electrical measuring instruments and measure various electrical parameters like current, voltage, power.
4. Use common testing instruments used in electrical workshops: 1: Test lamp. 2: line tester. 3: Multimeter. 4: Clamp-on meter. 5;Megger
5. Identify different types of domestic wirings.
6. Identify and specify different types of wires, cables, cable joints used for different current and voltage ratings.
7. Identify different types of light sources, open circuit, closed circuit and short circuit.
8. Identify and specify different types of switches used for different applications as per current and voltage ratings.
9. Know the working of various electrical circuit protective devices (fuse, MCB,)
10. Identify and specify different types of conducting, insulating materials, resistors, capacitors and inductors as per standard color-code practice.
11. Solder various resistors, capacitors and electronic components on PCB.
12. Conduct mock artificial respiration and first aid exercises to learn about safety procedures of first aid in case of electrical hazards.
13. Study of earthing method

Course Title	APPLIED SCIENCE
Course Code	DGN105
Course Credit	Lecture : 3
	Practical : 1
	Tutorial : 0
	Total : 4

Course Learning Outcomes

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

- **Apply** the Measurement systems and its units, use of instruments like Vernier calipers, Screw gauge etc.
- **Understand** the concept of Light, X-ray, Laser, sound waves etc.
- **Uses** of different laws related to force, motion, Atomic model, pH value and corrosion and their use in engineering applications.
- **Execute** basic experiments related to Physics and Chemistry.

Detailed Syllabus

Module No.	Topics	No. of Sessions
SECTION I		
1	UNITS AND MEASUREMENT Introduction : Physical Quantities Types of physical quantities, Fundamental (Basic) physical quantities and their SI units, Derived quantities and their SI units Various Measurement systems: F.P.S, C.G.S., M.K.S. and SI unit system, Multiples and Sub-multiples of Standard Units. Measuring Instruments: Vernier Calipers: Principle, Least count, Probable zero errors, Method of measurement, Numerical problems. Micrometer Screw Gauge: Pitch, Least Count, Probable zero errors, Method of measurement, Numerical problems.	8
2	FORCE AND MOTION Recapitulation of equations of motion, equations of motion. Force: Basic forces, gravitational force, electrostatic force, electromagnetic force, nuclear force. Newton's First law of motion: Law of statement, Types of inertia, examples. Newton's second law of motion: Momentum, Measurement of force using second law, Impulse of force, examples of impulse, simple problems on	8

	<p>impulse.</p> <p>Newton's third law of motion: Law of Statement, conservation of momentum, simple problems, examples.</p>	
3	<p>SOUND WAVES</p> <p>Introduction: Waves.</p> <p>Types of sound waves: Transverse waves and longitudinal wave.</p> <p>Definition: Periodic time, Frequency, Wave length, speed of sound, simple harmonic motion.</p> <p>Acoustics of building: Echo, reverberation time, coefficient of absorption of sound, factors affecting reverberation time and acoustics of building.</p> <p>Ultrasonic and infrasonic sound waves, Piezo-electric method.</p>	5
SECTION II		
4	<p>OPTICS</p> <p>Introduction: Properties of light.</p> <p>Electromagnetic waves, Velocity of light.</p> <p>Reflection of light: Definition, justification, Laws of reflection, Reflection by plane mirror and curved mirror.</p> <p>Refraction of light: Definition, justification, Laws of refraction, Refractive index (Snell's Law), Numerical Problem on refractive Index, Total Internal reflection of Light.</p> <p>Interference of light: Definition, Constructive and destructive Interference.</p> <p>Polarization of light: Definition, justification and Uses.</p> <p>Lens: Definition of Lens, Types of lenses, Uses of lenses, Definitions of various terms related to lens. Lens formula (Gaussian formula), Problem based on Lens formula and focal power.</p> <p>Optical Instrument: Simple Microscope.</p>	8
5	<p>MODERN PHYSICS</p> <p>Introduction:</p> <p>X – Ray: Introduction, Meaning of X-ray, production of X-ray by Coolidge tube, Properties of X-ray, Applications of X – Rays.</p> <p>Laser: Introduction, Meaning of LASER, Stimulated & spontaneous emission, Population inversion method, Production of LASER by ruby crystal, Properties of Laser, Applications of Laser.</p>	8
6	<p>BASIC CONCEPTS OF CHEMISTRY</p> <p>Atomic structure of an Atom, Arrangement of electron, proton and neutron in Atom, Atomic number, Atomic Mass number with examples.</p> <p>Concept of Orbit and orbital, Auf-bau Principle.</p> <p>Chemical bonds: Ionic bond and covalent bond</p> <p>Definition of pH, pH of acid, Base and neutral solution.</p> <p>Definition of Corrosion, standard condition and brief idea about factors influencing corrosion.</p>	5

Reference Books:

1. Fundamental of Physics by David Halliday, Robert Resnick, Jearl Walker, John Wiley & Sons.
2. Engineering Chemistry by Jain and Jain, Dhanpat Rai Publication.
3. Applied Physics for Polytechnics by Prakash Manikpure, S. Chand & Company Ltd.
4. Engineering Physics by R. K Gaur, S L Gupta, Dhanpat Rai Publication.

List of Experiments

- 1 Determination of acceleration due to gravity (g) using simple pendulum.
- 2 To determine moment of inertia of fly wheel.
- 3 Measurement of static friction for a block by friction apparatus.
- 4 Precision measurement by Micrometer screw gauge.
- 5 Linear measurement by using vernier calipers.
- 6 To measure the pH value of given samples of solution.
- 7 To measure the rate of Corrosion metals in acid or alkaline media.
- 8 To determine Acid value of oil titration of given sample.
- 9 Acid -Base titration of given sample.
- 10 Determination of refractive index of given liquid sample using travelling microscope.

Course Title	ENGLISH AS A SECOND LANGUAGE, BEGINNERS LEVEL - 1	
Course Code	ESL102	
Course Credit	Lecture	: 3
	Practical	: 0
	Tutorial	: 0
	Total	: 3
Course Learning Outcomes		
At end of the course, students will:		
<ul style="list-style-type: none"> • Understand variety of academic, social and professional conversations. • Speak on a variety of topics in academic, social and professional contexts. • Read and understand language in academic, social and professional contexts. • Write and express ideas in routine academic, social and professional contexts. 		
Detailed Syllabus		
Module No.	Topics	No. of Sessions
SECTION-I		
1	Vocab Housie - Weather vocabulary - Common ailments - Apparel & Accessories - Family & Relations	8
2	Learn to Listen - Audios on asking & responding to questions, audios on what people do in their free time, and audios on movie review.	6
3	Giving Directions - Usage of preposition in giving Directions with the help of Maps.	6
4	Describing People & Place - Traits & appearance - Words used in describing places - Words used in describing places	5
SECTION-II		
5	Telephoning - Inquiring - Appointment - Request - Ordering food on phone	6

6	Idioms & Phrases - Commonly used idioms & phrases	3
7	Reading - Skimming – Scanning	6
8	Writing Emails - Academic & Semi-formal Emails	5

Course Title	MATHEMATICS-I
Course Code	DGN109
Course Credit	Lecture : 4
	Practical : 0
	Tutorial : 0
	Total : 4

Course Learning Outcomes

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

- **Demonstrate** algebraic facility with algebraic topics including linear, quadratic, exponential, Logarithmic and trigonometric functions.
- **Define** and **use** the elementary Trigonometric function sin, cosine.
- **Classify** complex number algebraically and geometrically.
- **Compute** the values of Trigonometric function for key angles in all Quadrates of unit circle Measured in both degrees and radius.

Detailed Syllabus

SECTION I

Module No.	Topics	No. of Sessions
Unit-1	EXPONENTIAL AND LOGARITHM FUNCTION Exponential function: definition & properties, logarithm functions: definition & concept, logarithm rules, examples based on rules & calculations. PROGRESSION Arithmetic & Geometric progression, computation of nth term of an A.P. and G.P., Sum of n terms of an A.P. and G.P., Arithmetic & Geometrical mean.	8
Unit-2	MATRICES & DETERMINED Definition of determinants, expansion of determinants of order 2 and 3. definition of matrix, type of matrix, addition and subtraction of matrices, Product of a matrix with scalar, product of two matrices, Transpose of a matrix, Ad joint of a matrix, Inverse of a matrix for order 3, Examples to solve linear simultaneous equations in R^2 and R^3 .	12
Unit-3	VECTOR ALGEBRA Introduction, Geometrical representation of vectors, addition and subtraction of vector and its properties, multiplication of vector by scalar, position vector, product of two vector, scalar or dot product, definition of work done by force & momentum of force and their application.	8

SECTION II

Unit-4	COMPLEX NUMBER Concept, module and amplitude form, root of complex number, properties of complex number Addition and multiplication, Representation of complex number in the form $a+ib$, conjugate complex number.	5
Unit-5	TRIGONOMETRY Measurement of angles, degree and radians, T-ratios, concept of allied angles, concept of addition & subtraction formula, sum & difference for 2A & 3A and their multiples.	16
Unit-6	APPLICATION OF TRIGONOMETRY Periodic function, graph of sine and cosine, sine and cosine rules, projection formulae, Napier's formula, solution of triangle.	7

Text book

1. Polytechnic Mathematics by Dr. R. P. Rethaliya, NiravPrakasan.

Reference Books:

1. Applied Mathematics for Polytechnics by H.K.Dass, S. Chand Publication.
2. Elementary Engineering Mathematics by Dr. B.S.Grewal, Khanna Publication.
3. Applied Mathematics –I by Dr. A. K. Shinha, Satya Prakashan.

Course Title	FUNDAMETAL OF DC CIRCUITS	
Course Code	DEE109	
Course Credit	Lecture	: 3
	Practical	: 1
	Tutorial	: 1
	Total	: 5
Course Learning Outcomes		
<p>At the end of the session student will be able:</p> <ul style="list-style-type: none"> • Identify the commonly used materials and components used in electrical engineering • Calculate voltage and current in the given resistive circuits using KCL and KVL. • Classify types of electrical Circuits • Calculate the energy stored in Capacitors and inductor • Compare between electrical circuit and magnetic circuit 		
Detailed Syllabus		
SECTION I		
Module No.	Topics	No. of Sessions
1	Basics of Electrical Engineering <ul style="list-style-type: none"> • various electrical parameters : Charge, Current, Potential, voltage, power, Energy , potential difference ; EMF ,Definitions of Work, Power and Energy (both electrical and mechanical); Conversion from Mechanical units into Electrical units ,The commonly used materials and components used, in electrical engineering : Conductors, Insulators, semiconductors 	5
2	Electrical Resistor <ul style="list-style-type: none"> • Definition and its Unit, Ohms law: applications and limitations, Specific Resistance and its unit ,affecting the resistance ,Different types of resistor ,Demonstrate color coding techniques for measurement and its application ,Effect of temperature on resistance and temperature co-efficient, Joules law of heat and problems on Heating 	8

3	Electrostatics & Capacitors <ul style="list-style-type: none"> Electric charge, Laws of electrostatics, Electric field, Electrostatic induction, Electric flux, Flux Density, Electric field Intensity, Capacitance – Effects of Dielectrics, dielectric constant units, Types of Capacitors, Capacitors in series and parallel, Energy stored in a Capacitor, Rise and Decay of current in R-C Circuit and time constant 	8
----------	---	----------

SECTION II

4	Electromagnetic Induction & Inductors <ul style="list-style-type: none"> Electromagnetic Induction, Magnetic field, Magnetic flux, magnetic flux density, Magnetic intensity or magnetizing force, Permeability, Faraday's law, Lenz's law, Fleming's right hand rule for Generators, Fleming's left hand rule for Motors, Statically and dynamically induced EMF, Inductance: Self and Mutual inductance, Energy stored in Magnetic field, Comparison between electrical circuit and magnetic circuit, Magnetic hysteresis 	10
5	Electrical circuits <ul style="list-style-type: none"> Concept of Open circuit, Closed circuit, Short circuit, Definitions of node, branch, loop, mesh, Kirchhoff's laws and simple numerical, Kirchhoff's Voltage and Current law (KVL and KCL), Mesh Analysis and Nodal Analysis of Networks, Principle of Duality, Series and Parallel circuits with numerical problems. 	5
6	Network Theorems <ul style="list-style-type: none"> Linear & Nonlinear circuit, Active and Passive Network, Super Position Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem, Reciprocity Theorem, Star delta transformations with numerical 	6

Reference Books:

1. Fundamentals Of Electrical Engineering And Electronics by S.K.SAHDAV, Dhanpat rai & company publication
2. Electrical technology volume-I by B.L. Thereja, A.K. Thereja, S.Chand publication
3. Principle of electrical engineering & electronics by V.K. Mehta, S.Chand publication

List of Experiments:

1. Measure voltage and current in a given linear electrical circuit.
2. Calculate temperature co-efficient of a given resistor.
3. Connect resistances in series to get required effective resistance and Verify
4. Connect resistances in parallel to get required effective resistance and verify
5. Connect resistances in parallel and series to get required effective resistance and verify
6. Measure current in a particular branch of the given electrical circuit using Kirchoff's Current Law
7. Measure voltage drop in a closed loop of the given electrical circuit using Kirchoff's Voltage Law
8. Measure current in a particular branch of the given electrical circuit having two input sources using Superposition theorem
9. Verify Thevinin's theorem for a given circuit
10. Verify Norton;s theorem for given circuit
11. To performance Hysteresis characteristic of magnetic core