Veermata Jijabai Technological Institute (V.J.T.I)

(Central Technological Institute, Maharashtra State, INDIA)

H. R. Mahajani Marg, Matunga, Mumbai 400019

Tel.No. +91 22 24198101-02   Fax: +91 22 24102874   Website: www.vjti.ac.in

Programme Name: Diploma In Electrical Engineering

Programme Code	: DEE		With Effect From Academic Year		: 2023-24
Duration of Programme	: 6 Semester		Duration		: 16 WEEKS
Semester	: Second		Scheme		: R-2023

Sr No	Course Title	Abbreviation	Course Type	Course Code	Total IKS Hrs for Sem.	Actual Contact Hrs./Week			Self Learning (Term Work + Assignment)	Notional Learning Hours /Week	Credits	Paper Duration (hrs.)	Theory					Based on LL & TL				Based on Self Learning		Total Marks
						CL	TL	LL					FA-TH(MST)	SA-TH (ESE)		Total		FA-PR(CA)		SA-PR (PR/OR)		SLA		
													Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
1	MATHEMATICS II	MS-II	AEC	232 MA21	2	4	2	-	2	8	4	3	30	70	28	100	40			-	-	25@	10	125
2	CHEMISTRY	CHEM	DSC	232 CH22	2	3	1	2		6	3	3	30	70	28	100	40	25@	10	25#	10	-	-	150
3	BASICS OF ELECTRONICS	BOE	DSC	232 EE23	1	3	2	3		8	4	3	30	70	28	100	40	25@	10	25#	10	-	-	150
4	POWER PLANT ENGINEERING	PPE	DSC	232 EE24	1	3	1	-		4	2	3	30	70	28	100	40	25@	10	25#	10	-	-	150
5	ELECTRICAL CIRCUITS I	EC-I	DSC	232 EE25	0	3	1	2		6	3	3	30	70	28	100	40	25@	10	25#	10	-	-	150
6	MECHANICAL WORKSHOP	MW	SEC	232 EE26	0	-	2	2	2	4	2		-	-	-	-	-	25@	10	-	-	25@	10	50
7	PYTHON (ONLINE)	SS	SEC	232 EE27		-	-	2		2	1		-	-				25@	10	25*#	10	-	-	50
8	SOCIAL & LIFE SKILLS	SLS	VEC	232 EE28				1	1	2	1	-	-	-		-	-	25@	10	-	-	25@	10	50
	Total				6	16	7	12	5	40	20					500		175		125		50		875

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

Course Category: Discipline Specific Course Core (DSC): 2, Discipline Specific Elective (DSE): 0, Value Education Course (VEC): 1, Intern. /Apprenti./Project./Community (INP) : 0, Ability Enhancement Course (AEC) : 2, Skill Enhancement Course (SEC) : 2, Generic Elective (GE) : 0

Curriculum Coordinator   Head of Electrical Engineering (DEE)   Dean Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	: DEE
SEMESTER	: SECOND
COURSE TITLE	: MATHEMATICS – II
COURSE CODE	:232MA21

I. TEACHING, LEARNING AND EXAMINATION SHCEME:

Course Code	Course Title	Abbrevation	Course Category	Actual Contact Hrs. CL	TL	LL	SLH	NLH	Credits	Paper Duration	Theory FA-TH(MST) Max	SA-TH (ESE) Max	Min	Total Max	Min	Based on LL & TSL Practical FA-PR Max	Min	SA-PR Max	Min	Based on SL SLA Max	Min	Total Marks
232MA21	Mathematics II	MA-II	AEC	4	2	-	2	8	4	03	30	70	28	100	40	25 @	10	-	-	25 @	10	150

Total IKS Hrs for Sem.: 02 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

II. COURSE OBJECTIVES:

1. To teach students basic facts, concepts and principles of mathematics as a tool to analyze engineering problems.
2. To make students well versed in the prerequisites for further studies in mathematics and engineering.

III. COURSE OUTCOMES:

Student should be able to

CO1	Use derivatives in applications, apply formulae and different methods of integration in engineering concepts. Apply definite integral to find area under curve, mean and RMS
CO2	Use different methods to solve differential equations.
CO3	Apply formulae of Laplace Transform to solve engineering problems, differential equations

IV.   COURSE CONTENT:

SECTION-I								
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		Higher ordered derivative	3	3	1	40%	40%	20%
	1.1	Second ordered derivative of explicit functions						
2		**Applications of Derivative**	5	8	1	40%	40%	20%
	2.1	Maxima and minima (simple numerical problems)						
	2.2	Tangent and normal						
3		**Integration**	15	24	1	40%	40%	20%
	3.1	Definition of integration. Integration of standard functions.						
	3.2	Theorems of integration. Simple problems $\dfrac{f'(x)}{\int f(x)dx}$ based on standard results.						
	3.3	Methods of Integration 3.3.1 Integration of rational functions. ($\dfrac{1}{x^2+a^2}$, $\dfrac{1}{\sqrt{x^2+a^2}}$, $\sqrt{x^2+a^2}$ etc nine formulae) 3.3.2 Integration by partial fractions. (linear and repeated linear factors) 3.3.3 Integration by parts.						
4		Indian knowledge system Vedic Mathematics	2					
		SECTION-II						
		Topics/Sub-topics						
5		**Definite Integral**	5	9	1	40%	40%	20%
	5.1	Definition of definite integral.						
	5.2	Properties of definite integral with simple problems.						

	5.3	Applications of definite integral 4.3.1 Area under the curve. 4.3.2 Mean and RMS values						
6		**Differential equations.**	5	9	2	40%	40%	20%
	6.1	Order and degree of differential equations.						
	6.2	Method to solve differential equations of first order and first degree.						
		6.2.1 Variable separable method.						
		6.2.2 Linear differential equation.						
7		**Laplace Transform**	15	17	3	40%	40%	20%
	7.1	Definition of Laplace Transform						
	7.2	Standard results						
	7.3	Properties of Laplace Transform 6.3.1 First Shifting property. 6.3.2 Laplace Transform of first order derivative						
	7.4	**Inverse Laplace Transform**						
		Definition						
		6.4.1 Inverse Laplace Transform of standard functions						
		6.4.2 Method of partial fractions.						
	7.5	Application of Laplace transform to solve first order first degree linear differential equations						

V. LIST OF ASSIGNMENTS/TUTORIALS:

Sr. No.	Unit	Tutorials	Approx. Hours	CO
1	1,2	Higher ordered derivative, maxima and minima, tangent and normal	2	1
2	3	Integration using standard results	2	1
3	3	Integration of rational functions	2	1
4	3	Integration by partial fractions.	2	1
5	3	Integration by parts.	2	1
6	5	Definite integral. Area under the curve, mean, R.M.S.	2	1
7	6	Differential Equations	2	2

8	7	Laplace transform	2	3
9	7	Inverse Laplace transform	2	3

VI. SUGGESTED SELF LEARNING ASSIGNMENTS / MICROPROJECT / ACTIVITIES

Assignments (if any)

- Collect examples based on real world applications of logarithm and prepare a pdf file
- Collect at least 10 examples based on real world applications of standard deviation/variance.

Micro Project (if any)

- Prepare models using matrices to solve simple problems based on cryptograph

VII. ASSESMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Tutorials
- Midterm Test Exam
- Self-learning
- Term Work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- End Term Exam
- Micro-project/Assignments Tutorial Performance

VIII. REFERENCE BOOKS AND WEBSITES:

Sr. No.	Author	Title	Publisher and Edition
1	B. M. Patel, J. M. Rawal	Applied Mathematics	Nirali Prakashan
2	S. P. Deshpande	Mathematics for Polytechnic	Pune Vidyarthi Griha Prakashan.

IX.   COs POs Matrix

Course Outcomes	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)			
	PO-1 Basic And Discipli Ne Specific Knowle Dge	PO-2 Proble m Analy si s	PO-3 Design/ Develop ment of Solutions	PO-4 Engineer ing Tools	PO-5 Engineeri ng Practices for Society, Sustainabi lity and Environm en T	PO-6 Project Manage Ment	PO-7 Life Long Learni ng	PS O1	PS O2	PS O3	PS O4
CO1	2	1	1	1	0	0	1	2	1	0	0
CO2	2	1	1	1	0	0	1	2	1	0	0
CO3	2	1	1	1	0	0	1	2	1	0	0

Curriculum Coordinator

Head of the department

Diploma in Electrical Engineering

Dean-Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	: DEE
SEMESTER	: SECOND
COURSE TITLE	: CHEMISTRY
COURSE CODE	: 232CH22

I. TEACHING, LEARNING AND EXAMINATION SHCEME:

Course Code	Course Title	Abbreviation	Course Category	Learning Scheme					Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs.							Theory				Based on LL & TSL				Based on SL		
																	Practical				
				CL	TL	LL	SLH	NLH			FA-TH (MST)	SA-TH (ESE)		Total		FA-PR		SA-PR		SLA	
											Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
232CH22	CHEMISTRY	CHEM	DSC	3	1	2	-	6	3	3	30	70	28	100	40	25 @	10	25 #	10	-	-	150

Total IKS Hrs for Sem.: 02 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

II. COURSE OBJECTIVES:

1. To understand atomic structure, mole concept and volumetric analysis.
2. To represent the formation of bonds in molecules.
3. Generalize different factors which affect atmospheric as well as electrochemical Corrosion.
4. Know various insulating or dielectric materials, metal and alloys used for electronics.
5. To understand Basics of Electrochemistry for engineering applications.

III. Course Outcomes:

Student should be able to:

CO1	Define and identify various types of chemical compounds and their properties such as acids, bases, salts, oxidizing and reducing agents.
CO2	Describe structure of atom, types of titrations and methods of various corrosion protections.

						R	U	A
CO3		Apply the knowledge of conductivity of electrolytes, electrolysis, lubricants and insulators in engineering applications.						

IV. COURSE CONTENT:

SECTION-I								
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Atomic Structure and Chemical Bonding**						
	1.1	Definitions of Elements, atom, Molecules, Fundamental particles of atom, their mass, charge, location, Definition of atomic number, atomic mass number, Isotopes and Isobars, Electronic configuration based on Hunds Rule, Aufbau's principle, (n+l) Rule, Pauli's exclusion principle (up to Atomic no. 30).						
	1.2	Definitions: atomic weight, equivalent weights of an element, Molecular weight, Mole in terms of number, mass, volume, Definitions of equivalent weight and, Molecular weight of molecule,	10	8	2	40%	40%	20%
	1.3	Determination of percentage composition of an element in a given molecule,						
	1.4	Chemical bond, octet rule, formation of various types of chemical bonds: Covalent, Ionic, Coordinate covalent bonds along with examples CH_4, H_2, O_2, N_2, NaCl, $MgCl_2$, H_3O^+, NH_4^+, BF_3-NH_3.						
2		**Solution and Acid, Base & Salt**						
	2.1	Solution, Concentrations of solution: Normality, Morality, Molality.						
	2.2	Volumetric analysis, Titrations, Acid base titration, Acidimetry, Akalimetry, Redox titration, Iodometric titrations, Complexometric titration, and Precipitation titration.	8	14	1, 2	40%	40%	20%
	2.3	Definitions & theories of acids & bases: Arrhenius theory, Lowry-Bronsted theory and Lewis theory.						
	2.4	pH, pOH, pH scale.						

	2.5	Definition of salts with examples.						
3.		**Ionic Equilibrium**						
	3.1	Electrolytes, Types of Electrolytes, Degree of dissociation & Ostwald's dilution law.	06	13	3	40%	40%	20%
	3.2	Conductivity of Electrolytes – Concept of Ohms Law, Specific Conductivity, Specific Resistance, Equivalent Conductivity & Molar Conductivity,						
	3.3	Variation of Specific & Equivalent conductance with dilution, Cell Constant: Definition & Derivation.						

<div align="center">

SECTION-II

</div>

Unit & Sub-Unit	Topics/Sub-topics						
4.	**Electrochemistry**						
4.1	Electrochemistry, Electrochemical reactions, Construction and working of electrochemical cell & electrolytic cell,						
4.2	Faradays I & II laws of electrolysis, Applications of electrolysis: electroplating & refining	08	14	3	40%	40%	20%
4.3	Electrochemical cells and batteries, Construction, working and applications of dry cells, Lead acid storage batteries, fuel cells.						
4.4	Band Gap and Valence Bond Theory (VBT)						
5.	**Redox Reactions and Corrosion**						
5.1	Introduction, Oxidation, Reduction, Electron transfer concept, Oxidising & reducing agents, Definition, Types of corrosion Atmospheric corrosion, oxide films, factors affecting Atmospheric corrosion,	08	12	2	40%	40%	20%
5.2	Electrochemical corrosion and Galvanic corrosion,						

	5.3	Protective measures against corrosion: Electrochemical protection by sacrificial anodic protection and impressed current, cathodic protection coatings (galvanic and zinc, organic coating agents Electroplating, metal cladding,).							
6		**Engineering Materials**							
	6.1	**Metals & Alloys (Cu, Zn &Al):** Composition, properties and uses							
	6.2	**Semiconductors and Superconductors:** Definition, properties, applications and effect of Temperature.	08	9	3	40%	40%	20%	
	6.3	**Insulators:** Definition of Dielectrics and Insulators, Classifications of Insulating Materials, Properties & Applications of Inert Gases, Silicone Fluids, Mineral Oil, Teflon, Epoxy Resin and Ceramics.							

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).

Notes: This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.

V. LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS:

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1	2	To study the use of indicators, for identification of acid, base and neutral solutions from the given set of solutions.	2	1
2	2	To standardize HCl solution using N/10 Na_2CO_3.	2	1
3	2	To standardize $KMnO_4$ solution using N/10 $C_2H_2O_4$ solution.	2	2
4	2	To standardize EDTA solution using N/10 $ZnSO_4$ solution	2	2
5	2	To standardize $Na_2S_2O_3$ solution using N/10 $K_2Cr_2O_7$ solution.	2	2
6	3	To determine Cell Constant of a conductivity cell.	2	3

7		4	To conductance of a given solutions of various concentrations.	2	3
8		4	To determine EMF of a Cell.	2	3

VI. SUGGESTED SELF LEARNING ASSIGNMENTS / MICROPROJECT / ACTIVITIES

Assignments (if any)

- Collect examples based on real world applications of logarithm and prepare a pdf file
- Collect at least 10 examples based on real world applications of standard deviation/variance. Micro Project (if any)
- Prepare models using matrices to solve simple problems based on cryptograph

VII. ASSESMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Tutorials
- Midterm Test Exam
- Self-learning
- Term Work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- End Term Exam
- Micro-project/Assignments
- Tutorial Performance

VIII. REFERENCE BOOKS AND WEBSITES:

Sr. No.	Author	Title	Publisher and Edition
1.	Jain & Jain	Engineering Chemistry	Dhanpat Rai & Co. (Pvt.) Delhi – 110006 Ltd. Edition: (2008)
2.	S. N. Narkhede, R. M. Gangrade, M. S. Pawar, M. A. Sutar	Applied Science	Neerali Prakashan, Pune- 411030 Edition: (2014)
3.	Shashi Chawla	A Text Book of Engineering Chemistry	Educational & Technical Publishers Dhanpat Rai & Co. (Pvt.) Ltd, Edition: Third (2005)

4.	S. S. Dara & S. S. Umare	A Text Book of Engineering Chemistry	S. Chand & Company Ltd. Ram nagar, New Delhi – 110 055 Edition: Twelfth (2010)

IX. COs POs Matrix

Course Outcomes	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)			
	PO-1 Basic And Discipli Ne Specific Knowle Dge	PO-2 Proble m Analy si s	PO-3 Design/ Develop ment of Solutions	PO-4 Engineer ing Tools	PO-5 Engineeri ng Practices for Society, Sustainability and Environmen T	PO-6 Project Manage Ment	PO-7 Life Long Learni ng	PS O1	PS O2	PS O3	PS O4
CO1	2	1	1	1	0	0	1	2	1	0	0
CO2	2	1	1	1	0	0	1	2	1	0	0
CO3	2	1	1	1	0	0	1	2	1	0	0

Curriculum Coordinator

Head of the department
Diploma in Electrical Engineering

Dean-Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	: DEE
SEMESTER	: SECOND
COURSE TITLE	: BASICS OF ELECTRONICS
COURSE CODE	: 232EE23

I. TEACHING, LEARNING AND EXAMINATION SHCEME:

Course Code	Course Title	Abbrevation	Course Category	Actual Contact Hrs.					Credits	Paper Duration	Assessment Scheme				Based on LL & TSL				Based on SL		Total Marks
											Theory				Practical						
				CL	TL	LL	SLH	NLH			FA-TH(MST)	SA-TH (ESE)		Total		FA-PR		SA-PR		SLA	
											Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
232EE23	BASICS OF ELECTRONICS	BOE	DSC	3	1	2	8	4	3	30	70	28	100	40	25 @	10	25 #	10	-	-	150

Total IKS Hrs for Sem.: 01 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment,SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

II. COURSE OBJECTIVES:

1. Classify the different sources of electric power generation.
2. Get the knowledge of principle and operation of power generation
3. To understand function of each component of power plant.

III. COURSE OUTCOMES:

Student should be able to:

CO1	Analyze the structure of different types of semiconductor crystal structures
CO2	Understand the theory of operation and characteristics of pn junction diode and Zener diode.
CO3	Explain the construction working and application of optoelectronic devices

						R	U	A
CO4		Apply various number systems in digital design.						
CO5		Develop skill to build, and troubleshoot digital circuits.						

IV. COURSE CONTENT:

SECTION-I

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		Semiconductor Physics :	4	6	1,2	40%	40%	20%
	1.1	Germanium & Silicon Intrinsic						
	1.2	Sem Extrinsiciconductor. P type & N type semiconductor,						
	1.3	Effect of temperature on semiconductor.						
2		**PN Junction** Diode	6	15	1,2	20%	40%	40%
	2.1	Germanium Diode, Silicon Diode their construction.						
	2.2	Working under no bias Forward bias & reverse bias condition.						
	2.3	Forward & Reverse Characteristics.						
	2.4	Piecewise linear equivalent circuit						
	2.5	Important specifications (ratings) of a PN junction diode						
	2.6	Zener diode: Construction, Characteristics, Various Applications (Ratings).						
	2.7	Zener diode application in a simple voltage r regulator to circuit with examples.						
3		Optoelectronic Devices :	6	14	1,2	30%	40%	30%
	3.1	Construction, working, characteristics and applications of photoconductive cell, photovoltaic cell.						
	3.2	Construction, working, characteiistics and applications of Light Emitting Diode, InfraRed Lig h t Emitting Diode.						

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
3.3		Construction, working, characteristics and all applications of Liquid Crystal Display.						

SECTION-II

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
4		**Introduction, Number Systems, Codes:**						
	4.1	Introduction to digital system, Conversion between decimal, binary, octal & Hexadecimal numbers.	6	12	3	30%	40%	30%
	4.2	Binary arithmetic.1 's& 2's complements of binary num bers.						
		Signed numbers, arithmetic opens with signed numbers						
		BCD 842.1 code, 9's & 10's complement, BCD arithmetic, Excess3						
5		**Logic Gates**						
	5.1	AND, OR, NOT, NAND, NOR, EX —OR, EX- NOR Gates.	6	14	3	30%	40%	30%
	5.2	Boolean Algebra: Operations, Expressions, Laws & Rules. De-Morgan's Theorems.						
	5.3	NAND & NOR used as universal gates Simplification of Logic Expression by using Boolean Algebra.						
6		**Combinational Logic Circuits**						
	6.1	Sum -Of-Products (SOP) & Product-Of-Sums (POS) forms of logic expression, their conversion to standard forms	4	9	3	30%	40%	30%
	6.2	Karnaugh map reduction technique for 2 to 4 input variables function.						
	6.3	Karnaugh map reduction by Don't Care Condition. Troubleshooting of logic circuits						

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).

V. LIST OF EXPERIMENTS:

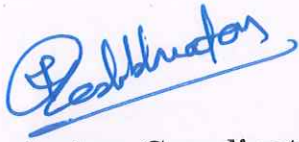| Sr. No.	Practical	Approx. Hours	CO
1	Characteristics of Germanium and Silicon Diode.	2	1,2,3
2	Characteristics of Zener Diode	2	
3	Characteristics of Light Emitting Diode (Red, Green, Yellow and Bl 2 color).	2	2,3
4	To verify the truth table of TTL logic gate IC's 7432, 7486	2	4,5
5	To verify the truth table of TTL logic gate IC's 7408,7400, 7402.	2	4,5
6	To verify the NAND and Nor Gate as universal Gate.	2	4,5
7	To verify the design of Half adder and Full adder using Kainarigh reduction.	2	4,5
8	To verify the design of Half subtractor and Full subtractor using Kainatigh map reduction	2	4,5
9	To verify the design of 4 bit Parallel adder subtractor using Karnaugh map reduction	2	4,5
10	To verify the design of BCD adder subtractoi using Karnaugh map reduction.	2	4,5

VI. LIST OF TEXT BOOKS/REFERENCE BOOKS;

Sr. No	Author	Title	Publisher with ISBN Number
1	Robert Boylestad & Louis Nashelsky,	Electronic Devices and Circuit Theory,9"' Edition	Prentice Hall India Private Limited
2	A. Anand Kumar	Fundamentals of Digital Circuits, 3'^{d} Edition	Prentice Hall India Private Limited
3	Albert Paul Malvino	Electronic Principles,7"' Edition	Tata McGraw - Hill Publishing Company Ltd.
4	David Bell.	Electronic Devices and Circuits, 5"' Edition	Oxford University Press.
5	Thomas L. Floyd	Digital Fundamentals by 8"' Edition.	Pearson Education Inc.

VII.   COS POS MATRIX

VIII.	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)			
Course Outcomes	PO-1 Basic And Discipli Ne Specific Knowle Dge	PO-2 Proble m Analy si s	PO-3 Design/ Develop ment of Solutions	PO-4 Engineer ing Tools	PO-5 Engineeri ng Practices for Society, Sustainabi lity and Environm en T	PO-6 Project Manage Ment	PO-7 Life Long Learni ng				
								PS O1	PS O2	PS O3	PS O4
CO1	3	2	2	1	0	0	2	3	1	0	0
CO2	2	1	0	0	0	0	2	3	1	0	0
CO3	3	2	0	0	0	0	1	3	1	0	0
CO4	2	2	2	1	0	0	2	3	1	0	0
CO5	3	2	1	2	1	0	2	3	1	0	0

Curriculum Coordinator   Head of the department   Dean-Diploma

Diploma in Electrical Engineering

DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	: DEE
SEMESTER	: SECOND
COURSE TITLE	: POWER PLANT ENGINEERING
COURSE CODE	: 232EE24

I.   TEACHING, LEARNING AND EXAMINATION SHCEME:

Course Code	Course Title	Abbreviation	Course Category	Learning Scheme Actual Contact Hrs. CL	TL	LL	SLH	NLH	Credits	Paper Duration	Assessment Scheme Theory FA-TH(MST) Max	SA-TH (ESE) Max	SA-TH (ESE) Min	Total Max	Total Min	Based on LL & TSL Practical FA-PR Max	FA-PR Min	SA-PR Max	SA-PR Min	Based on SL SLA Max	SLA Min	Total Marks
232EE24	POWER PLANT ENGINEERING	PPE	DSC	3	1	-	-	4	2	3	30	70	28	100	40	25 @	10	25 #	10	-	-	150

Total IKS Hrs for Sem.: 01 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

II.   COURSE OBJECTIVES:

1   Classify the different sources of electric power generation.
2   Get the knowledge of principle and operation of power generation
3   To understand function of each component of power plant.

III.   COURSE OUTCOMES:

Student should be able to:

CO1	Categorizing the various energy sources along with the power generation
CO2	Estimate the load demands for generation of power.
CO3	Comparative study of all types of power generation with respect to construction and working principle.

IV.   COURSE CONTENT:

		SECTION-I						
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Basis of Power Generation**	3	5	1	40%	40%	20%
	1.1	Various sources of energy						
	1.2	Overview of electrical power Generation in India and future perspectives.						
2		**Economics of power Generation**	6	10	2	30%	40%	30%
	2.1	Terms commonly used in system operation: connected load, firm power, cold reserve, hot reserve, spinning reserve.						
	2.2	Curves used in system operation such as Load-curve, load duration curve, integrated duration curve. (Simple numerical based on plotting above curves.)						
	2.3	Factors affecting the cost of Generation: Average demand, Maximum demand, demand factor, plant capacity factor, plant use factor, diversity factor, load factor and plant load factor (Simple numerical based on above)						
	2.4	Choice of Size & number of Generator Units, difficulties involved in it.						
3		**Conventional Power Plant**	15	20	3	40%	40%	20%
	3.1	**Thermal Power Plant:** -Schematic diagram and working of Thermal Power Station. Main parts of Thermal plant in brief (Boiler, Economizer, Air pre-heater, Superheaters & re-heaters. Steam prime movers, Condensers. Spray ponds & Cooling towers). Selection of site for thermal power stations. List of thermal power stations in Maharashtra state with their capacities.						

	3.2	Hydro Power Plant: - Block diagram and working of Hydro Power Station. Brief introduction about main parts of the Hydro Power Plant Selection of site for hydro power stations. List of hydro power stations in Maharashtra state with their capacities.						
	3.3	Nuclear Power Plant:-Schematic						

		diagram and working of Nuclear Power Station. Brief introduction about main parts of the Nuclear Power Plant. Construction and working of various types of Nuclear Reactor. List of Nuclear power stations in Maharashtra state with their capacities.						

SECTION-II

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
4		**Non- conventional energy sources**						
.	4.1	Types of non-conventional energy sources Solar Energy, Wind Energy, Bio-mass & Bio-gas energy, Geo-thermal Energy, Ocean energy. Schematic and brief working of these power plant.	10	10	1,3	40%	40%	20%
5		Present **plant study of** Solar **Power Plant & Wind Power Plant**						
	5.1	**Solar Power Plant** -Potential of solar energy, Solar Radiation Photovoltaic effect for solar energy, Brief introduction of PV material, working & applications of solar energy. PV system design and installation steps.	9	15	3	40%	40%	20%

5.2	Wind Power Plant -Wind Energy, Selection of site for wind mills, Principle of electricity generation with the help of wind energy, Block diagram and working of Wind energy plant and its applications, List of major wind farms in the Maharashtra state with their approximate capacities.						
6	**Combined Power Station**						
6.1	Diesel Power Station -Advantages and disadvantages. Schematic arrangement. Choice of site. Principle and operation of station. Application.	5	10	3	40%	40%	20%
6.2	Combined Cycle Power Station- Working principle of gas combined cycle advantages and disadvantages of open cycle, closed cycle, block diagram, application						

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).

V. List of Practical/Assignments/Tutorials:

Sr. No.	Assignments/Tutorials	CO
1	Four Assignments should be taken on the basis of syllabus	1,2,3
2	A case study should be done on any one of the power stations in Maharashtra. (Thermal and Hydro).	3
3	Brief report on Design and installation of small Solar/wind Power plant	3
4	Visit to one of the power stations during academic session (Thermal or Hydro).	3

VI. Test Books:

Sr.No	Author	Title	Publication and Edition
1	J. B. Gupta	A course in Electrical Power	S.K. Kataria & Sons

VII. References
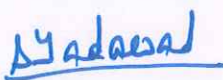
Sr.No	Author	Title	Publication and Edition
1	B.R. Gupta	Generation of Electrical Energy	Eurasia Publication House Pvt. Ltd
2	Soni, Gupta, Bhatanagar	A course in Electrical Power	Dhanapatrai and Sons
3	S.N. Singh	A course in Electrical Power	PHI Learning
4	M.V. Deshpande	Elements of Electrical Power Station Design	PHI Learning
5	G.D. Rai	Non-Conventional Energy Sources	Khanna Publications

VIII. COS POS MATRIX

III.	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)			
Course Outcomes	PO-1 Basic And Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning				
								PSO1	PSO2	PSO3	PSO4
CO1	2	0	1	1	2	0	2	3	1	0	0
CO2	3	3	2	1	2	0	1	3	1	0	0
CO3	3	0	1	2	1	0	1	3	1	0	0

Curriculum Coordinator

Head of the department
Diploma in Electrical Engineering

Dean-Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	: DEE
SEMESTER	: SECOND
COURSE TITLE	: ELECTRICAL CIRCUITS-I
COURSE CODE	: 232EE25

I. TEACHING, LEARNING AND EXAMINATION SHCEME:

Course Code	Course Title	Abbrevation	Course Category	Actual Contact Hrs.			SLH	NLH	Credits	Paper Duration	Theory						Based on LL & TSL (Practical)				Based on SL (SLA)		Total Marks
				CI	TL	LL					FA-TH(MST)	SA-TH (ESE)		Total			FA-PR		SA-PR		SLA		
											Max	Max	Min	Max	Min		Max	Min	Max	Min	Max	Min	
232EE25	ELECTRICAL CIRCUITS-I	EC-I	DSC	3	2	2		6	3	3	30	70	28	100	40		25@	10	25#	10	-	-	150

Total IKS Hrs for Sem.: 00 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment,SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

RATIONALE

Electric circuits are classified in several ways. Adirect-currentcircuit carries current that flows only in one direction. Analternating-currentcircuit carries current that pulsates back and forth many times each second, as in most household circuits. Aseries circuitcomprisesa path along which the whole current flows through each component. Aparallel circuitcomprises branches so that the current divides and only part of it flows through any branch.

The voltage, or potential difference, across each branch of a parallel circuit is the same, but the currents may vary. In a home electrical circuit, for instance, the same voltage is applied across each light or appliance, but each of these loads draws a different amount of current, according to its power requirements. A number of similar batteries connected in parallel provides greater current than a single battery, but the voltage is the same as for a single battery

VI. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Apply the concept of electrical circuits to solve the existing industry-based technology problems and also find innovative solutions to problems in the other sectors of engineering.

VII. COURSE LEVEL LEARNING OUTCOMES (COS)

Students will be able to achieve & demonstrate the following COs on completion of course based learning

CO1	Articulate in working of various components of a circuit.
CO2	Analyze and solve various dc circuits.
CO3	Analyze A.C. circuits and its parameters.

VII. COURSE CONTENT:

SECTION-I								
Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level	
1	**Circuit elements and Sources**							
1.1	Terms in Electrical circuits.							
1.2	Elements of Electrical circuit 1.2.1 Active and Passive element 1.2.2 Linear and non-Linear element 1.2.3 Unilateral and Bilateral element 1.2.4 Lumped and Distributed element	6	6	1,2	40%	40%	20%	
1.3	Types of sources 1.3.1 Ideal and Practical voltage and current sources 1.3.2 Independent and Dependent voltage and current sources							
1.4	Source Transformation.							

2		Circuit Analysis						

	2.1	Network Reduction Techniques
		    2.1.1 Series and parallel connections of resistive networks
		    2.1.2 Star–to-Delta and Delta-to-Star Transformations for Resistive Network.
			9	12	1,2	20%	40%	40%

	2.2	Kirchoff's Voltage Law (KVL) and Kirchoff's Current Law (KCL).						
	2.3	Mesh analysis of circuits with resistors and independent sources						
	2.4	Nodal analysis of circuits with resistors and independent sources.						
3		Network Theorems						
	3.1	Superposition theorem 3.1.1 Numericalwithindependent sources						
	3.2	Thevenin's theorem 3.2.1 Numerical with independent source	9	12	1,2	30%	40%	30%
	3.3	Norton's theorem 3.3.1 Numerical with independent sources						
	3.4	Maximum power transfer theorem 3.4.1 Numerical with independent sources						

<div align="center">SECTION-II</div>

Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
4	Single phase AC circuits						

4.1	Introduction of single phase
	    4.1.1 Generation of single-phase AC
	    4.2.2 Terms used
	    4.2.3 Emf equation (no derivation)
		8	12	3	30%	40%	30%

4.2	Representation of single-phase AC
	    4.2.1 Graphical form
	    4.2.2 Magnitude form
	    4.2.3 Mathematical form						

5		Analysis of single phase AC circuits						

	5.1	Components of single phase AC
		    5.1.1 Impedance triangle
		    5.1.2 Power triangle
		    5.1.3 Power factor						

	5.2	Circuit analysis for pure Resistive load	10	12	3	30%	40%	30%
	5.3	Circuit analysis for pure Inductive load						
	5.4	Circuit analysis for pure Capacitive load						
	5.5	Analysis of R-L, R-C, R-L-C series and parallel circuit. 5.5.1 Numerical on R-L, R-C, RL-C series circuit.						
6		**Graph Theory and Network Topology**						
	6.1	Introduction of Graph theory	6	6	3	30%	40%	30%
		6.1.1 Graph of network 6.1.2 Tree, Co-Tree						

	6.2	Lop incidence matrix
		    6.2.1 Cut set matrix
		    6.2.2 Tie set matrix
		    6.2.3 Loop current matrix						

	6.3	Number of possible trees of graph						
	6.4	Analysis of network equilibrium equation and principle of duality						

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).

VIII. LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1.	2	Determine the loop currents in any DC network	2	1, 2
2.	2	Determine the node voltages in any DC network	2	1 , 2
3.	3	Verification of principle of superposition with DC sources.	2	2, 3
4.	3	Verification of Thevenin, theorems in DC circuits	2	2, 3
5.	3	Verification of Norton theorems in DC circuits	2	2, 3
6.	3	Verification of Maximum power transfer theorems in DC circuits	2	2, 3
7.	4	Analysis of single phase circuits using resistor, inductor & capacitor elements.	2	4
8.	5	Study of RLC series resonance	1	5
9.	5	Study of RLC Parallel resonance	1	5

* Minimum 8 and maximum 12 practicals/experiment sessions to be included in a course in a term

IX. TEXT BOOKS AND REFERENCE BOOKS

Sr. No.	Author	Title	Publisher and Edition
1	M.E. Van Valkenberg	Network Analysis	3rd Edition
2	W H Hyat	Engineering Circuit Analysis	7th Edition
3	D Roy Chaudhari	Network Systems	2ND Edition

X.   COS POS MATRIX

IV.	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)			
Course Outcomes	PO-1 Basic And Discipli Ne Specific Knowle Dge	PO-2 Proble m Analy si s	PO-3 Design/ Develop ment of Solutions	PO-4 Engineer ing Tools	PO-5 Engineeri ng Practices for Society, Sustainabi lity and Environm en T	PO-6 Project Manage Ment	PO-7 Life Long Learni ng				
								PS O1	PS O2	PS O3	PS O4
CO1	3	2	1	1	0	0	2	3	1	0	0
CO2	3	3	1	1	0	0	1	3	1	0	0
CO3	3	3	1	1	0	0	1	3	1	0	0

Curriculum Coordinator

Head of the department
Diploma in Electrical Engineering

Dean-Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	: DEE
SEMESTER	: SECOND
COURSE TITLE	: MECHANICAL WORKSHOP PRACTICE
COURSE CODE	: 234ME26

I. TEACHING, LEARNING AND EXAMINATION SHCEME:

Course Code	Course Title	Abbrevation	Course Category	Actual Contact Hrs. CL	TL	LL	SLH	NLH	Credits	Paper Duration	Theory FA-TH (MST) Max	SA-TH (ESE) Max	Min	Total Max	Min	Based on LL & TSL Practical FA-PR Max	Min	SA-PR Max	Min	Based on SL SLA Max	Min	Total Marks
234ME26	MECHANICAL WORKSHOP PRACTICE	MWP	SEC	-	-	2	2	4	2	-	-	-	-	-	-	25 @	10	-	-	25 @	10	50

Total IKS Hrs for Sem.: 00 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

II. COURSE OBJECTIVES:

a. To lay a strong foundation in study and practice of basic workshop processes this is the backbone in Engineering.

b. To make students well versed to identify, select and use various marking, measuring, holding, striking and cutting tools & equipments.

III. COURSE OUTCOMES:

Student should be able to:

CO1	Learn types of workshop activities, basics of different machines and equipment.
CO2	Inspect and produce the job as per specified dimensions.

	CO3	Adopt safety practices while working on various machines.

IV.   LIST OF PRACTICAL

Sr. No.	Practical	Approx. Hours	CO
1	**Carpentry Shop:** Demonstration of different wood working tools / machines. Demonstration of different wood working processes, like plaining, marking, chiseling, grooving, turning of wood etc. One simple job involving any one joint like mortise and tenon, dovetail, bridle, half lap etc.	10	2,3
2	**Smithy shop** Demonstration of different forging tools and Power Hammer. Demonstration of different forging processes like shaping, caulking, fullering, setting down operation etc. One job like hook peg, flat chisel or any hardware item.	10	
3	**Sheet Metal Shop:** Demonstration of different sheet metal tools / machines. Demonstration of different sheet metal operations like sheet cutting, bending, edging, end curling, lancing, soldering and riveting. One simple job involving sheet metal operations and soldering and riveting.	10	2,3

V.   TEXT BOOKS AND REFERENCE BOOKS

Sr. No.	Author	Title	Publisher and Edition
1	K.C.John	Mechanical Workshop Practice	PHI Learning Pvt Ltd. EEE 2010
2	B.S. Raghuwanshi	Workshop Technology	Dhanpat Rai and sons, New Delhi, 9th Edition, 2002

| 3 | S.K. Hajra Chaudhary | Workshop Technology Vol I & II | Media Promotors and Publisher, New Delhi. 8 [th] edition , 1986 |

VI. COS POS MATRIX

	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)			
Course Outcomes	PO-1 Basic And Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environmen T	PO-6 Project Management	PO-7 Life Long Learning				
								PS O1	PS O2	PS O3	PS O4
CO1	3	1	1	1	0	0	1	3	1	0	0
CO2	3	1	1	1	0	0	1	3	1	0	0
CO3	3	1	1	1	0	0	1	3	1	0	0

Curriculum Coordinator

Head of the department

Dean-Diploma

Diploma in Electrical Engineering

DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	: DEE
SEMESTER	: SECOND
COURSE TITLE	: SOFTWARE SKILLS (PYTHON)
COURSE CODE	: 232EE27

I. TEACHING, LEARNING AND EXAMINATION SHCEME:

Course Code	Course Title	Abbrevation	Course Category	Actual Contact Hrs. CL	TL	LL	SLH	NLH	Credits	Paper Duration	Theory FA-TH(MST) Max	SA-TH (ESE) Max	Min	Total Max	Min	Based on LL & TSL Practical FA-PR Max	Min	SA-PR Max	Min	Based on SL SLA Max	Min	Total Marks
232EE27	SOFTWARE SKILLS (PYTHON)	SS	SEC	-	-	2	2	1			-	-	-	-	-	-	-	25 *#	10	-	-	25

Total IKS Hrs for Sem.: 0 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

II. RATIONALE

Python has become one of the most popular programming languages in recent years. It's been used in everything from machine learning to building websites and software testing. Developers and non-developers alike find it useful.

Python, one of the most popular programming languages in the world, has created everything from Netflix's recommendation algorithm to the software that controls self-driving cars. Python is a general-purpose language, used to create a range of applications, including data science, software and web development, automation, and improving the ease of everyday tasks.

Python is a computer programming language often used to build websites and software, automate tasks, and analyze data. Python is a general-purpose language, not specialized for any specific problems, and used to create various programmes. This versatility and its beginner-friendliness have made it one of the most used programming languages today.

As an Electrical Engineer, one of the big advantages of using Python is controlling and automating test equipment. It's becoming more and more common to find low-cost test equipment fitted with USB outputs that can collect data and store them in common formats such as CSV.

III. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Python is commonly used for developing websites and software, task automation, data analysis, and data visualisation. Since it's relatively easy to learn, Python has been adopted by many non-programmers, such as accountants and scientists, for a variety of everyday tasks, like organising finances.

You can write programs for many reasons, ranging from making your living to solving a difficult data analysis problem to having fun to helping someone else solve a problem." Python can be applied to solve the existing industry-based technology problems and also find innovative solutions to problems in the other sectors of engineering.

IV. COURSE LEVEL LEARNING OUTCOMES (COS)

Students will be able to achieve & demonstrate the following COs on completion of course based learning

CO1	Absolute understanding about the basics of Python
CO2	Study and implementation of various tools in Python
CO3	Creating Python program

V. COURSE CONTENT:

SECTION-I								
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Introduction to Python and basic Syntax**						
	1.1	Getting started with Anaconda (Jupyter Notebook)						
	1.2	What is Python	4		1,2	40%	40%	20%
	1.3	Features of Python						
	1.4	Application of Python						
	1.5	Variables, Rules of defining the variables						
2		**Datatypes in Python**						
	2.1	Define Datatype	6		1,2	20%	40%	40%
	2.2	Classification of Datatypes						

			Hours	Marks	CO	R Level	U Level	A Level
	2.3	String Operation and methods						
	2.4	Tuple operation and methods						
	2.5	5 List operation and methods						
	2.6	Dictionary operation and methods						
	2.7	Set operation and methods						
3		**Operators in Python**						
	3.1	Define Operator						
	3.2	Classify Operators						
	3.3	Arithmetic Operators	6		1,2	30%	40%	30%
	3.4	Comparison Operators						
	3.5	Logical Operators						
	3.6	Bitwise Operators						

<div align="center">SECTION-II</div>

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
4		**Decision Making, Loops and Function in Python**						
	4.1	Decision making 4.1.1 If-else statement 4.2.2 Nested if statement						
	4.2	2 Loops in Python: 4.2.1 While loop 4.2.2 For loop	6		3	30%	40%	30%
		Functions in Python: 4.3.1 Built- in function 4.3.2 User -defined function						
5		**Introduction to Numpy**						
	5.1	Define Array						
	5.2	creation of Array						
	5.3	Slicing and indexing of an array	6		3	30%	40%	30%
	5.4	Vectorization of an array						
	5.5	Arithmetic and statistical array						
6		**Introduction to Pandas**						
	6.1	Pandas and its data structures						
	6.2	Reading csv and xlsx file in Pandas	4		3	30%	40%	30%
	6.3	Attributes and methods in data frame						
	6.4	Data frame operations						

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).

VI.   LIST OF PRACTICAL

Sr. No.	Practical	Approx. Hours	CO
1	Installing Jupyter Notebook using Anaconda on Windows. Print "Hello World"	2	1,2,3
2	Addition and subtraction of two numbers in Python	2	2,3
3	Write a program in python to create a list and Tuple	2	2,3
4	Write a program in python to create a Dictionary and set	2	2,3
5	Write a program in python to study various operators.	2	2,3
6	Write a program in python for loop, while loop.	2	2,3
7	Write a program in python to study various funcions	2	2,3
8	Write a program in python to create an Array using NUMPY	2	2,3
9	Write a program in python to read different files using PANDAS	2	2,3

VII.   Micro project:

Self Learning Mini Project Outcome (SLMPO)	Sr. No	Mini Project	Relevant COs
SLMPO 1. Python project on given dataset	1	**Apply all tools of python on given dataset**	CO3

Each Micro Project carries 5.5 marks each including2.5 marks for timely completion.

VIII.   RUBRIC-SELF LEARNING MICRO PROJECT AND ASSIGNMENT

Criteria (Outcome) Level	Weightage %	Exemplary 21-25	Proficient 16-20	Average 10-15	Unsatisfactory 0-10
Detailed study of tools, operators, datatypes and functions	50%	Able to explain and apply all the tools, operators, datatypes and functions in	Proficient explanation and application of tools, operators, datatypes and functions in	Average explanation and application of tools, operators, datatypes and functions in	Unsatisfactory explanation and application of tools, operators, datatypes and functions in Python.

		Python	Python	Python	
Correct application of tools, operators, datatypes and functions on given data set.	50%	Able to program efficiently without help.	Able to program with a little help.	Able to program with few errors.	Not able to program.

IX. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr. No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Laptop/Desktops and internet	All

X. ASSESMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Tutorials
- Midterm Test Exam
- Self-learning
- Term Work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- End Term Exam
- Micro-project/Assignments Tutorial Performance

XI. TEXT BOOKS AND REFERENCE BOOKS

Sr. No.	Author	Title	Publisher and Edition
1	Allen B. Downey	Think Python: How to Think Like Computer Scientist	2nd edition, (O'Reilly, 2015)
2	Zed A. Shaw	Learn Python 3 the Hard Way	Addison-Wesley, 2016
3	Dan Bader	Python Tricks: A Buffet of Awesome Python Features	dbader.org, 2017

XIII. COS POS MATRIX

XIV.	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)			
Course Outcomes	PO-1 Basic And Discipli Ne Specific Knowle Dge	PO-2 Proble m Analy si s	PO-3 Design/ Develop ment of Solutions	PO-4 Engineer ing Tools	PO-5 Engineeri ng Practices for Society, Sustainability and Environmen T	PO-6 Project Manage Ment	PO-7 Life Long Learni ng				
								PS O1	PS O2	PS O3	PS O4
CO1	3	1	1	1	0	3	2	3	1	0	0
CO2	3	1	1	1	0	3	2	3	1	0	0
CO3	3	1	1	1	0	3	2	3	1	0	0

Curriculum Coordinator   **Head of the department**   **DeanDiploma**

Diploma in Electrical Engineering

DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRICAL ENGINEERING
PROGRAMME CODE	: DEE
SEMESTER	: SECOND
COURSE TITLE	: SOCIAL & LIFE SKILLS
COURSE CODE	: 232EE28

I. TEACHING, LEARNING AND EXAMINATION SHCEME:

Course Code	Course Title	Abbrevation	Course Category	Learning Scheme – Actual Contact Hrs. CL	TL	LL	SLH	NLH	Credits	Paper Duration	Assessment Scheme – Theory FA-TH(MST) Max	SA-TH (ESE) Max	SA-TH (ESE) Min	Total Max	Total Min	Based on LL & TSL Practical FA-PR Max	FA-PR Min	SA-PR Max	SA-PR Min	Based on SL SLA Max	SLA Min	Total Marks
232EE28	SOCIAL & LIFE SKILLS	SIS	VEC	-	-	1	1	2	1		-	-	-	-	-	25@	10	-	-	25@	10	50

Total IKS Hrs for Sem.: 00 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

II. RATIONALE

Life skills can be defined as abilities that enable humans to deal effectively with the demands and challenges of life. Social skills are a subset of life skills that are needed for successful, healthy relationships to easily adapt when moving from one social situation to the next. They help regulate our emotions effectively and develop enduring, supportive relationships, we're happier and healthier. This is why developing life skills and eventually social skills is key not only to being successful in life, it's key for our health and well-being. Thus, Teaching of Social and life skills provide students with essentials of knowing, understanding attitudes, values, morals, social skills and better equip them to handle stress and build their self efficacy, self esteem and self confidence.

III. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Exhibit psychosocial competencies, workplace ethics, resilience, positive attitude, integrity and self confidence

IV. COURSE LEVEL LEARNING OUTCOMES (COS)

Students will be able to achieve & demonstrate the following COs on completion of course based learning

CO1	Develop ability to adapt to new challenges.
CO2	Manage emotions effectively.
CO3	Follow workplace ethics and practices
CO4	Manage time Effectively.
CO5	Increased self -confidence to handle stress.

V. COURSE CONTENT:

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
		SECTION-I						
1		**Activities Under Unnat Maharashtra Abhiyan (UMA)**						
	1.1	Introduction to Societal Needs and respective stakeholders :Regional societal issues that need engineering intervention						
	1.2	Multidisciplinary approach linkages of academia, society and technology						
	1.3	Stakeholders' involvement						
	1.4	Introduction to Important secondary data sets available such as census, district economic surveys, cropping pattern, rainfall data, road, network data	3	5	1	30%	50%	20%
	1.5	Problem Outline and stakeholders :Importance of activity and connection with Mapping of system components and stakeholders (engineering / societal						
	1.6	Key attributes of measurement						

	1.7	Various instruments used for data collection - survey templates, simple measuring equipments 1.8 Format for measurement of identified attributes/ survey form and piloting of the same						
	1.8	Fieldwork : Measurement and quantifications of local systems such as agriculture produce, rainfall, Road network, production in local industries, Produce /service which moves from A to B						
	1.9	Analysis and Report writing Report writing containing Introduction of the topic ,Data collected in various formats such as table, pie chart, bar graph etc Observations of field visits and data collected						
2		**National Service Scheme (NSS)**						
	2.1	Contacting Village/Area Leaders						
	2.2	Primary socio economic survey of few villages in the vicinity of the institute.	5	4	2	20%	40%	40%
	2.3	Selection of the village for adoption - conduct of activities						
	2.4	Comprehensive Socio Economic Survey of the Village/Area						
	2.5	Identification of Problems						
	2.6	Dissemination of information about the latest developments in agriculture, watershed management, wastelands development, non conventional energy, low cost housing, sanitation, nutrition and personal hygiene, schemes for skill development, income generation, government schemes, legal aid, consumer protection and allied fields.						
	2.7	A liaison between government and other development agencies for the implementation of various development schemes in the selected village/ slum.						
3.		**Universal Human Values**						

	3.1	Love and Compassion (Prem and Karuna): Introduction, Practicing Love and Compassion (Prem and Karuna)						
	3.2	Truth (Satya) : Introduction, Practicing Truth (Satya)						
	3.3	Non-Violence (Ahimsa) : Introduction, Practicing Non-Violence(Ahimsa)	5	3	3	30%	40%	30%
	3.4	Righteousness (Dharma) : Introduction, Practicing Righteousness (Dharma)						
	3.5	Peace (Shanti) : Introduction,Practicing Peace (Shanti)						
	3.6	Service (Seva) : Introduction, Practicing Service(Seva)						
	3.7	Renunciation (Sacrifice) Tyaga : Introduction, Practicing Renunciation (Sacrifice) Tyaga						
	3.8	Gender Equality and Sensitivity: Introduction, Practicing Gender Equality and Sensitivity						
4.		**Value Education (Unnati Foundation)**						
	4.1	Punctuality, Icebreaker and Simple Greeting, Understanding & Managing Emotions, Introducing Self,The power of a Positive Attitude, Talking about one's Family, Making a Positive Impression, Give word list for a Word based						
	4.2	Cleanliness , Hygiene and Orderliness , Likes and Dislikes, Developing Confidence in Self and Others, Strengths and Weaknesses, Listening Skills ,Greeting gestures, Gender Equality and Sensitivity	5	2	4	40%	40%	20%
	4.3	Responsibility, OCSEM-Visual Comprehension and Word Based Learning, Goal Setting – Make it happen, Follow, Like & Share Unnati Social Media - Facebook / Instagram/ Twitter Introducing Others, Time Management, Talking about the daily routine, Money Management						
	4.4	Gratitude and Appreciation , Asking Simple Questions & Asking for the price , Stress Management, Student Referral process						

		,Comprehending & Paraphrasing Information, A Plate of Rice and Dignity of Labour, Topics for Public Speaking, Placement Process , OCSEM-E Newspaper, Critical Thinking to overcome challenges						
	4.5	Determination and Persistence, Guiding and Giving Directions, Language Etiquette & Mannerism, Unnati Philosophy , Unnati Branding - Follow, Like & Share Unnati Social Media -Facebook / Instagram/ Twitter, Simple instructions to follow procedures, Assertiveness, Give topics for Debate, Describing a person/Objects, Refusal Skills, Word List for Word based Learning						
	4.6	Respect, Comparing , OCSEM - Public Speaking, Student referral process, Attending a phone call, Being a Good Team Player , Placement Process, At a Restaurant, Workplace ethics						
	4.7	Team Spirit, Inviting someone, OCSEM – Picture Reading & Word, a. Unnati Philosophy & b. Unnati Branding - Follow, Like & Share Unnati Social Media - Facebook / Instagram/ Twitter, Apologizing, Apologizing, Dealing effectively with Criticism, Introduce Importance of Self Learning and up skilling						
	4.8	Caring and Sharing , Handling Customer queries, Flexibility & Adaptability , Student referral process, Writing a Resume, OCSEM-Public Speaking, Placement Process, Meditation						
5.		**Financial Literacy**						
	5.1	Introduction - Life Goals and financial goals						
	5.2	Savings and Investments - Three pillars of investments, Popular asset classes, Government schemes, Mutual Funds, Securities markets (Shares and bonds), Gold, Real Estate, Do's and Don'ts of Investments	5	2	5	40%	40%	20%
	5.3	Retirement planning						

	5.4	Cashless transactions					
	5.5	Income, expenditure and budgeting – Concepts and Importance					
	5.6	Inflation- Concept, effect on financial planning of an individual					
	5.7	Loans – Types, Management of loans, Tax Benefits					
	5.8	Insurance – Types, Advantages, selection 5.9 Dos and Don'ts in Financial planning and Transactions					

VI. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)

Suggestive list of activities during Regular as well as Special Camping (NSS Activities)
Following list is only an illustrative list of the type of activities that can be undertaken. Under the programme it would be open to each NSS Unit to undertake one of these programmes or any other activity which may seem desirable to them according to local needs. The NSS Unit should aim at the integrated development of the area selected for its operation which could be a village or a slum. It has also to be ensured that at least a part of the programme does involve manual work.

(a) Environment Enrichment and Conservation:
The activities under this sub-theme would inter-alia, include:
(i)   plantation of trees, their preservation and upkeep
(ii) Construction & maintenance of village streets, drains
(iii) Cleaning of village ponds and wells;
(iv) Popularization and construction of Gobar Gas Plants, use of non-conventional energy; (v) Disposal of garbage & composting;
(vi) Prevention of soil erosion and work for soil conservation,
(vii) Watershed management and wasteland development
(viii) Preservation and upkeep of monuments, and creation of consciousness about the preservation of cultural heritage among the community.

(b) Health, Family Welfare and Nutrition Programme:

(i)   Programme of mass immunization;
(ii) Working with people in nutrition programmes with the help of Home Science and medical college students;
(iii) Provision of safe and clean drinking water;
(iv) Integrated child development programmes;

(v) Health education, AIDS Awareness and preliminary health care. (vi) Population education and family welfare programme; (vii) Lifestyle education centres and counselling centres.
© Programmes aimed at creating an awareness for improvement of the status of women: (i) programmes of educating people and making them aware of women's rights both constitutional and legal; (ii) creating consciousness among women that they too contributed to economic and social well-being of the community;

(iii) creating awareness among women that there is no occupation or vocation which is not open to them provided they acquire the requisite skills; and

(iv) imparting training to women in sewing, embroidery, knitting and other skills wherever

possible. (d) Social Service Programmes:

(i) work in hospitals, for example, serving as ward visitors to cheer the patients, help the patients, arranging occupational or hobby activities for long term patients; guidance service for out-doorpatients including guiding visitors about hospital's procedures, letter writing and reading for the patients admitted in the hospital; follow up of patients discharged from the hospital by making home visits and places of work, assistance in running dispensaries etc.

(ii) work with the organisations of child welfare;

(iii) work in institutions meant for physically and mentally handicapped;

(iv) organising blood donation, eye pledge programmes;

(v) work in Cheshire homes, orphanages, homes for the aged etc.;

(vi) work in welfare organisations of women;

(vii) prevention of slums through social education and community action;

(e) Production Oriented Programmes:

(i) working with people and explaining and teaching improved agricultural practices; (ii) rodent control land pest control practices;

(iii) weed control;

(iv) soil-testing, soil health care and soil conservation;

(v) assistance in repair of agriculture machinery;

(vi) work for the promotion and strengthening of cooperative societies in villages;

(vii) assistance and guidance in poultry farming, animal husbandry, care of animal health etc.;

(viii) popularisation of small savings and assistance in procuring bank loans

(f) Relief & Rehabilitation work during Natural Calamities: (i) assisting the authorities in distribution of rations, medicine, clothes etc.;

(ii) assisting the health authorities in inoculation and immunisation, supply of medicine etc.;
(iii) working with the local people in reconstruction of their huts, cleaning of wells, building roads etc.; (iv) assisting and working with local authorities in relief and rescue operation; (v) collection of clothes and other materials, and sending the same to the affected areas; (g)

Education and Recreations: Activities in this field could include:

(i) adult education (short-duration programmes);

(ii) pre-school education programmes;

(iii) programmes of continuing education of school drop outs, remedial coaching of students from weaker sections; (iv) work in crèches;

(v) participatory cultural and recreation programmes for the community including the use of mass media for instruction and recreation, programmes of community singing, dancing etc.;

(vi) organisation of youth clubs, rural land indigenous sports in collaboration with Nehru Yuva Kendras; (vii) programmes including discussions on eradications of social evils like communalism, castism, regionalism, untouchability, drug abuse etc.;

(viii) non- formal education for rural youth and (ix)

legal literacy, consumer awareness.

VII. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table) : NOT APPLICABLE

VIII. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)

Formative assessment (Assessment for Learning) Report and presentation of fieldwork activities, Self Learning (Assignment)

Summative Assessment (Assessment of Learning)

IX. LIST OF TEXT BOOKS/REFERENCE BOOKS:

Sr. No	Author	Title	Publisher with ISBN Number
1	IRAP, Hyderabad, CTARA, IIT Bombay and UNICEF, Mumbai	Compendium of Training Materials for the Capacity Building of the Faculty and Students of EngineeringColleges on 'IMPROVING THE PERFORMANCE OF RURAL WATER SUPPLY AND SANITATIONSECTOR IN MAHARASHTRA' Districts Economic survey reports	UNICEF
2	Central Public Health and Environmental Engineering Organisation	Manual on Water Supply and Treatment	Ministry of Urban Development, New Delhi
3	Specifications And Standards Committee	Indian Standards (IS) Codes and Indian Roads Congress (IRC) Codes	Bureau of Indian Standards and The Indian Road Congress

4	Prepared by each district administration	Districts Economic survey reports	Govt. of Maharashtra
5	Local college students, UMA staffs	Sample Case Studies on UMA website	IITB-UMA team

X. LEARNING WEBSITES & PORTALS

Sr. No	Link / Portal	Description
1	https://gr.maharashtra.gov.in/Site/Upload/Government%20Resolutions/English/201601131501523808.pdf	Government Resolution of Government of Maharashtra regarding Unnat Maharashtra Abhiyan
2	https://gr.maharashtra.gov.in/Site/Upload/Government%20Resolutions/English/201606151454073708.pdf	Government Resolution of Government of Maharashtra regarding Unnat Maharashtra Abhiyan Guidelines
3	https://censusindia.gov.in/census.website/	A Website of Census of India
4	https://gsda.maharashtra.gov.in/english/	A Website of Groundwater Survey and Development Agency, GoM
5	https://mrsac.gov.in/MRSAC/map/map	A Website where district-wise maps showcasing different attributes developed by Maharashtra Remote Sensing Applications Centre.
6	https://ejalshakti.gov.in/jjmreport/JJMIndia.aspx	A Website of Jal Jivan Mission, Government of India
7	https://cpcb.nic.in/	A Website of Central PollutionControl Board, Government of India
8	http://www.mahapwd.com/#	A Website of Public Works Department, GoM
9	http://tutorial.communitygis.net/	A Website for GIS data sets developed by Unnat Maharashtra Abhiyan
10	https://youtu.be/G71maumVZ1A?si=TzDTxKUpLYaRos7U	A video record of lecture by Prof. Milind Sohoni, IIT Bombay, on Engineering, Development and Society
11	https://youtu.be/TUcPNwtdKyE?si=wnSWrhGc9dJTC-ac	A keynote talk by Prof. MilindSohoni, IIT Bombay, on Interdisciplinary Engineering: The Road Ahead

12	https://youtu.be/mKJj6j_1gWg?si=ajE8s4lfB2OM63Ng	A TED talk by Prof. Milind Sohoni, IIT Bombay, on Vernacular Science: The Science of Delivery
13	https://www.ugc.gov.in/pdfnews/4371304_LifeSKill_JeevanKaushal_2023.pdf	UHV: UGC Course on life skills. Unit 4 i.e. Course 4 is to be referred
14	https://nss.gov.in/	NSS : Know about the NSS Scheme and details
10	https://youtu.be/G71maumVZ1A?si=TzDTxKUpLYaRos7U	A video record of lecture by Prof. Milind Sohoni, IIT Bombay, on Engineering, Development and Society

XI.   COS POS MATRIX

XII.	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)			
Course Outcomes	PO-1 Basic And Discipli Ne Specific Knowle Dge	PO-2 Proble m Analy si s	PO-3 Design/ Develop ment of Solutions	PO-4 Engineer ing Tools	PO-5 Engineeri ng Practices for Society, Sustainability and Environmen T	PO-6 Project Manage Ment	PO-7 Life Long Learni Ng				
								PS O1	PS O2	PS O3	PS O4
CO1	1	1	2	0	1	3	2	3	1	0	0
CO2	1	1	2	0	1	3	2	3	1	0	0
CO3	1	1	2	0	1	3	2	3	1	0	0
CO4	1	1	2	0	1	3	2	3	1	0	0
CO5	1	1	2	0	1	3	2	3	1	0	0

Curriculum Coordinator

Head of the department

Diploma in Electrical Engineering

Dean-Diploma