



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

(Central Technological Institute, Maharashtra State, INDIA)

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### Programme Name: Diploma In Electronics Engineering

Programme Code : DELNE 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	Learning Scheme						Credits	Paper Duration (hrs.)	Assessment Scheme										Total Marks			
						Actual Contact Hrs./Week			Self-Learning (Term Work + Assignment)	Notional Learning Hrs./Week	Theory						Based on LL & TL				Based on Self Learning						
						CL	TL	LL			FA-TH (MST)			SA-TH (ESE)			Total		FA-PR		SA-PR		SLA				
											Max			Min	Min	Max	Min	Max	Min	Max	Min	Max	Min				
1	ENGINEERING MATHEMATICS	MA-II	AEC	233MA21	2	3	2	-	-	5	2.5	3	30	70	28	100	40	25@	10	-	-	-	-	125			
2	ENGINEERING PHYSICS	PHY	DSC	233PH22	0	3	-	2	-	5	2.5	3	30	70	28	100	40	25@	10	25#	10	-	-	150			
3	ELECTRICAL CIRCUITS	EC	DSC	233EX23	0	3	2	2	-	7	3.5	3	30	70	28	100	40	25@	10	25#	10	-	-	150			
4	BASICS OF ELECTRONICS	BOE	DSC	233EX24	0	3	-	2	1	6	3	3	30	70	28	100	40	-	-	25#	10	25@	10	150			
5	OBJECT ORIENTED PROGRAMMING USING C++	OOPS	SEC	233EX25	0	3	-	2	-	5	2.5	3	30	70	28	100	40	25@	10	25#	10	-	-	150			
6	ENVIRONMENTAL STUDIES	ES	VEC	233EX26	0	2	-	-	2	4	2	-	-	-	-	-	-	25@	10	-	-	25@	10	50			
7	TECHNICAL COMMUNICATION & PRESENTATION SKILLS	TCPS	AEC	233HM27	0	1	1	2	-	4	2	-	-	-	-	-	-	25@	10	25#	10	-	-	50			
8	SOCIAL LIFE SKILLS	ECCA	VEC	233EX28				2	2	4	2	-	-	-	-	-	-	-	-	-	-	50@	20	50			
<b>Total</b>					<b>2</b>	<b>18</b>	<b>5</b>	<b>12</b>	<b>5</b>	<b>4</b>	<b>20</b>		<b>150</b>	<b>350</b>		<b>500</b>		<b>150</b>		<b>125</b>		<b>100</b>		<b>875</b>			

**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, \*# On Line Examination, @\$ Internal Online Examination

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

  
Curriculum Coordinator

  
Head Diploma in Electronics Engineering



  
Dean - Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRONICS ENGINEERING
PROGRAMME CODE	: DELNE
SEMESTER	: SECOND
COURSE TITLE	: ENGINEERING MATHEMATICS
COURSE CODE	: 233MA21

## I. TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME						EXAMINATION SCHEME											
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
							Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	2	-	-	2.5	3	30	70	28	100	40	25	10	-	-	-	-	125

Total IKS Hrs for Sem. : 6 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

Course Category: Discipline Specific Course Core (DSC) : 3, Discipline Specific Elective (DSE) : 0, Value Education Course (VEC) : 1, Intern/Apprentice/Project/Community (INP) : 0, Ability Enhancement Course (AEC) : 2, Skill Enhancement Course (SEC) : 2, Generic Elective (GE) : 0

## II. RATIONALE

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

## III. COURSE OUTCOMES (COs)

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

CO1 – Use elementary operations of complex numbers to solve the problems.

CO2 – Apply derivatives in Engineering applications. Apply different methods of integration in Engineering problems and use definite integral to find area under curve, Mean, RMS value



of the function.

CO3 – Use different methods to solve differential equations.

CO4 – Apply basics of statistics in engineering problems.

#### IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION - I								
Unit & Sub-Unit	Topics/Subtopics	Hours	Marks	COs	R Level	U Level	A Level	
1	<b>Complex Numbers</b>	4	6	1	40%	40%	20%	
1.1	Elementary operations, complex conjugate							
2	<b>Higher ordered derivative.</b>	2	3	2	40%	40%	20%	
2.1	Review of Derivatives, Second ordered derivative of explicit functions							
3	<b>Applications of Derivative</b>	3	8	2	40%	40%	20%	
3.1	Maxima and minima ( simple numerical problems)							
3.2	Tangent and normal							
4	<b>Integration</b>	11	18	2	40%	40%	20%	
4.1	Definition and Rules of integration. Integration of standard functions, $\int f(ax + b)dx$ , $\int \frac{f'(x)}{f(x)}dx$							
4.2	Methods of Integration 4.2.1 Integration by partial fractions. 4.2.2 Integration by parts.							
5	<b>Indian knowledge system Vedic Mathematics</b>	6						
SECTION - II								
Unit & Sub-Unit	Topics/Subtopics	Hours	Marks	COs	R Level	U Level	A Level	
6	<b>Definite Integral</b>	5	10	2	40%	40%	20%	
6.1	Definition of definite integral.							



	6.2	Properties of definite integral with simple Problems (without proof)						
	6.3	Applications of definite integral 6.3.1 Area under the curve. 6.3.2 Mean and RMS values						
<b>7</b>		<b>Introduction to Differential equations.</b>	<b>5</b>	<b>9</b>	<b>3</b>	<b>40%</b>	<b>40%</b>	<b>20%</b>
	7.1	Concept of Differential equations, Order and degree of differential equations.						
	7.2	Methods to solve differential equations of first order and first degree.						
<b>8</b>		<b>Statistics</b>	<b>10</b>	<b>16</b>	<b>4</b>	<b>40%</b>	<b>40%</b>	<b>20%</b>
	8.1	Concept of Statistics, Range, Coefficient of range of grouped and ungrouped data.						
	8.2	Mean, Standard Deviation using step deviation method						
	8.3	Variance and coefficient of variation.						
	8.4	Combination formula " $C_r$ ", meaning and evaluate type of problems						
	8.5	Elementary probability, simple problems.						
Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms’s Revised Taxonomy).								

#### V. LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS

Sr. No.	Practical/Assignment/Tutorial Title	No. of Hours	Relevant COs
1	Complex numbers	2	1
2	Higher ordered derivative, maxima and minima, tangent and normal	2	2
3	Integration using standard results	2	2
4	Integration by partial fractions.	2	2
5	Integration by parts.	2	2
6	Definite integral. Area under the curve, mean, R.M.S.	2	2
7	Differential Equations	2	3
8	Mean, standard deviation, variance and coefficient of variation.	2	4



9	Elementary Probability,	2	4
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## VI. ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Tutorials
- Mid Semester Test
- Self-learning
- Term Work

Summative Assessment (Assessment of Learning)

- End Semester Examination.

## VII. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)					
	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	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	
CO1	2	1	1	1	0	0	1	1	1	1	0		
CO2	2	1	1	1	0	0	1	1	1	1	0		
CO3	2	1	1	1	0	0	1	1	1	1	0		
CO4	2	1	1	1	0	0	1	1	1	1	0		
Legends :- High:03, Medium:02,Low:01, No Mapping: - 0													



VIII. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

Sr. No	Author	Title	Publisher
1	B. M. Patel, J. M. Rawal	Applied Mathematics	Nirali Prakashan
2	S. P. Deshpande	Mathematics for Polytechnic	Pune Vidyarthi Griha Prakashan.
3	Deepak Singh	Mathematics-I	Khanna Book Publishing Co. (P) Ltd. ISBN: 978-93-91505-42-4
4	Garima Singh	Mathematics-II	Khanna Book Publishing Co. (P) Ltd. ISBN: 978-93-91505-52-3

  
Curriculum Coordinator

  
Head of the Department

  
Dean Diploma



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BOS VJTI Approval dated 1/8/2023



<b>DIPLOMA PROGRAMME</b>	<b>: DIPLOMA IN ELECTRONICS ENGINEERING</b>
<b>PROGRAMME CODE</b>	<b>: DELNE</b>
<b>SEMESTER</b>	<b>: SECOND</b>
<b>COURSE TITLE</b>	<b>: PHYSICS</b>
<b>COURSE CODE</b>	<b>: 233PH22</b>

### I. TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME						EXAMINATION SCHEME										
CL	TL	LL	Self-learning	CR	Paper Hrs	FA-TH (MST)	SA-TH (ESE)	TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
										FA-PR (CA)		SA-PR (PR/OR)		SLA		
										Max	Min	Max	Min	Max	Min	
3	-	2	-	2.5	3	30	70	100	40	25	10	25	10	-	-	150

### II. RATIONAL

Physics is a foundation of any engineering discipline. Its principles, laws, rules, results and conclusions drawn from observations and predictions of various phenomena occurring in nature; play important role in solving field problems in engineering and technology.

Though the span of physics is from quark to galaxy or particle physics to astrophysics; here certain topics are carefully selected for particular discipline. These topics will provide sufficient fundamental as well as background knowledge for the particular branch. Proper attention is given to the selection of sub-topics and their depth so that student will be able to cope up with innovations and new technologies in his field.

Various phenomena, principles, laws, rules discovered and invented by physics are used for industrial, engineering and technological applications. The overall growth of various engineering disciplines, namely, mechanical, electrical, electronics, civil, environmental and so on depends upon the development of physics and its detail understanding.



### III. COURSE OUTCOMES (COS)

Students will be able to achieve the following COS on completion of course based learning

**CO1** - Use various system for measurements and apply the knowledge to handle measuring instruments.

**CO2** - Understand properties of matter like elasticity, viscosity, surface tension along with relevant formulae, applications and problem solving based on it.

**CO3** - Understand concepts of atomic structure, semiconductors, modern physics used in x-rays and photoelectric effect with their applications and problem based on it.

**CO4** - Understand principles of heat, thermodynamics and apply it to solve the problems based on it.

**CO5** - Understands concepts used in various phenomena of optics, such as, wave theory, interference, diffraction, polarization etc. along with their applications and problems based on it.

### IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION - I							
Unit & Sub-Unit	Topics/Sub-topics	Hrs	Marks	COS	R Level	U Level	A Level
<b>1</b>	<b>Measurements</b>	<b>7</b>	<b>11</b>	<b>1</b>	<b>40%</b>	<b>40%</b>	<b>20%</b>
1.1	Need of measurements, requirements of standard unit, CGS, MKS, FPS and SI systems, fundamental and derived quantities/units, dimensions and dimensional analysis, problems						
1.2	Vernier caliper, screw gauge, spherometer. Least counts and range of voltmeter, ammeter and thermometer.						
1.3	Physics in Indian Knowledge System - Bhaskaracharya (Theory of gravity, Surya siddhanta & Sidhanta shriomani), Lilavati (Gurutvakashan Shakti).						
<b>2</b>	<b>Properties of matter</b>	<b>7</b>	<b>11</b>	<b>2</b>	<b>40%</b>	<b>40%</b>	<b>20%</b>
2.1	Elasticity- elasticity, plasticity, Hooke's law, Young's, Bulk and rigidity modulus, problems, relation between them, Searle's method of determination of Y, ultimate and breaking stress, factor of safety, wire under continuously increasing load.						
2.2	Surface tension - cohesive and adhesive forces, sphere of influence, molecular theory of surface						





	tension, angle of contact, capillarity (formula with derivation), problems.						
2.3	Viscosity -velocity gradient, Newton's law of viscosity, coefficient of viscosity, Stokes' law of viscosity, Stokes' method of viscosity, problems, laminar and turbulent flow, critical velocity, Reynold's number.						
<b>3</b>	<b>Heat and thermodynamics</b>	<b>10</b>	<b>13</b>	<b>3</b>	<b>40%</b>	<b>40%</b>	<b>20%</b>
3.1	Gas laws - Boyle's law, Charle's law, Gay- Lussac's law, absolute zero, Kelvin scale, work done at constant pressure, Cp, Cv and Mayer's relation (only formula), problems, isothermal, adiabatic, isobaric and isochoric processes.						
3.2	Expansion and transmission of heat- coefficients of linear, areal and cubical expansion, modes of transmission of heat, laws of thermal conductivity, coefficient of thermal conductivity, Lee's and Searle's methods, first law of thermodynamics, problems.						

SECTION - II							
Unit & Sub-Unit	Topics/Sub-topics	Hrs	Marks	CO	R Level	U Level	A Level
<b>4</b>	<b>Atomic structure and Modern Physics</b>	<b>10</b>	<b>14</b>	<b>4</b>	<b>40%</b>	<b>40%</b>	<b>20%</b>
4.1	Atomic structure - Dalton's atomic theory, Rutherford's atomic model, Bohr's atomic model, quantum numbers, Nucleus, electron, orbits, Pauli's exclusion principle.						
4.2	Semiconductor - Metals, Non, metals, Semiconductors, Types of semiconductors (Intrinsic, Extrinsic, Doping, p-type, n-type), electron- hole pair, Applications of semiconductor						
4.3	X-rays - Coolidge X-ray tube, continuous characteristic and X-rays, problems, properties and applications, Moseley's law						
	Photoelectric effect - Planck's theory of radiation, Einstein's photoelectric equation, problems, photocells-photo-emissive, photovoltaic and photoconductive (construction, working and applications).						
<b>5</b>	<b>Optics</b>	<b>14</b>	<b>21</b>	<b>5</b>	<b>40%</b>	<b>40%</b>	<b>20%</b>
5.1	Wave theory - wave front, wave normal, laws of						



	reflection and refraction, problems, Huygen's principle, total internal reflection.					
5.2	Interference - principle of superposition, constructive and destructive interference, conditions to obtain interference pattern, Problems.					
5.3	Diffraction – definition, types of diffraction, single slit diffraction pattern, diffraction grating, Grating element, grating formula, problems, determination of wavelength of light, problems.					
5.4	Polarization - polarized and unpolarized light, polarizer, analyzer, optical activity, optical rotation, Specific rotation, Polarimeter (principle, construction, working and applications), Problems.					

*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.	Practical/Assignment/Tutorial Title	No. of Hrs	Relevant COS
1	Use of Vernier calliper and observations with Travelling microscope	2	1
2	Use of micrometre screw gauge	2	1
3	Determination of surface tension of a liquid using capillary action	2	2
4	Determination of coefficient of viscosity of liquid by stokes method	2	2
5	Thermal conductivity of good conductor by Searl's method.	2	3
6	Thermal conductivity of bad conductor by Lee's method.	2	3
7	Determination of wavelength of light using diffraction	2	4
8	Determination of grating element.	2	4
9	Determination of specific rotation of liquid using polarimeter.	2	5
10	To find the refractive index of given glass using Snell's law	2	4

#### VI. SUGGESTED SELF LEARNING ASSIGNMENTS / MICROPROJECT / ACTIVITIES Assignments (if any)

- Convert the units of a given physical quantity from one system of units to another.



- Measure room temperature of hot baths / bodies by using mercury thermometer and convert it into different unit systems.
- Give details about the explanation of concept like electrostatics, magnetic domain, current.
- Calculate the refractive index of different materials.

#### Micro Project (if any)

- Conductivity: Collect different materials such as metal, plastics, glass etc. and prepare chart of their conductivity.
- Vernier Calipers: Prepare prototype vernier caliper of desired least count using card sheet.
- LDR: Use Light dependent resistor for measuring the intensity of light.

### VII. ASSESMENTS METHODOLOGIES /TOOLS

#### Formative Assessment (Assessment of Learning)

- Mid semester test
- Timely practical journal completion
- Performance in practicals

#### Summative Assessment (Assessment of Learning)

- End Term Exam
- Practical exam

### VIII. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	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	PSO- 1	PSO- 2	PSO- 3
CO1	3	2	1	1	-	-	2	2	-	-
CO2	3	2	1	1	-	-	1	2	-	-
CO3	3	2	1	1	-	-	1	1	-	-
CO4	3	2	1	1	-	-	1	2	-	-
CO1	3	2	1	1	-	-	2	2	-	-

Legends :- High:03, Medium:02,Low:01, No Mapping: - 0



IX. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

Sr. No	Author	Title	Publisher
1	--	XI <sup>th</sup> standard physics book	HSC Board, M.S. / NCERT
2	--	XII <sup>th</sup> standard physics book	HSC Board, M.S. I NCERT
3	Halliday D., Resnik R. and Walker	Fundament is of physics extended	Wiley India, New Delhi, 8 <sup>th</sup> edition
4	Serway RA and Jewett JW	Physics for scientists and Engineers	Cengage learning, New Delhi, 6 <sup>th</sup> edition
5	Verma H C	Concepts of Physics - Part I and II	Bharti Bhavan, New Delhi

  
Curriculum Coordinator

  
Head of the Department

  
Dean Diploma



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BOS VJTI Approval Dt. 01/08/2023



DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRONICS ENGINEERING
PROGRAMME CODE	: DELNE
SEMESTER	: SECOND
COURSE TITLE	: ELECTRICAL CIRCUITS
COURSE CODE	: 233EX23

#### TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME													
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)			TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
							Max	Min	Max	Min	FA-PR (CA)		SA-PR (PR/OR)		SLA			
											Max	Min	Max	Min	Max	Min		
3	2	2	-	3.5	3	30	70	28	100	40	25	10	25	10	-	-	150	

#### COURSE OBJECTIVES:

To explain and analyze different Circuit Elements and Energy Sources. To analysis of Network by Kirchoff's Laws, Node and Mesh Analysis. To analyze single phase circuits using resistor, inductor & capacitor elements. To explain and analyze series and parallel resonant behavior of a circuit. To analyze different theorems for dc circuits using dependent sources. To study fundamental principle and working of transformer and DC motors.

#### COURSE OUTCOMES (COS):

Students will be able to achieve the following COS on completion of course based learning

**CO1-** Demonstrate the fundamental principles, Kirchoffs laws and different theorems governing electrical circuits using independent source.

**CO2:** To analyze AC circuits including phasor representation, impedance calculations, 3 phase supply and resonant behavior.

**CO3 -** To develop problem-solving skills applicable to electrical circuit analysis.



**COURSE CONTENTS WITH SPECIFICATION TABLE:**

SECTION I							
Unit & Sub- Unit	Topics/Sub-topics	Hrs	Marks	CO	R Level	U Level	A Level
1	<b>Circuit Elements and Sources</b>	06	10				
1.1	E.M.F, Potential and Potential Difference, Current and Current Density	1		1	50%	50%	
1.2	Concept of Active and passive, Linear and non-linear, Unilateral and bilateral, Lumped and distributed	2		1	50%	30%	20%
1.3	Circuit elements-. Ideal and Practical Voltage and Current Sources. Conversion from one source into other	1		1	30%	20%	50%
1.4	Internal Impedance of voltage and current source relative to load	1		1	50%	50%	
1.5	Independent and Dependent Electrical Sources – Power and Energy Relations for Two-terminal Elements	1		1	50%	50%	
2	<b>Nodal Analysis and Mesh Analysis of resistive Circuits Using Independent sources:</b>	09	15				
2.1	Kirchhoff's Voltage Law (KVL), Kirchhoff's Current Law (KCL)	1		1	30%	20%	50%
2.2	Mesh Analysis of Circuits with Resistors and Independent Sources.	4		3	10%	20%	70%
2.3	Nodal Analysis of Circuits Containing Resistors and Independent Sources.	4		3	10%	20%	70%
3	<b>Circuit Theorems and Their Application in Electric Networks Using Independent sources</b>	09	15				



3.1	Linearity of a Circuit and Superposition Theorem, limitation of Superposition Theorem	2		1	20%	20%	60%
3.2	Thevenin's Theorem and Norton's Theorem	3		1	20%	30%	50%
3.3	Determination of Equivalent circuit containing Independent Sources	2		3	10%	10%	80%
3.4	Maximum Power Transfer Theorem	2		3	10%	30%	60%

SECTION II							
Unit & Sub- Unit	Topics/Sub-topics	Hrs	Marks	CO	R Level	U Level	A Level
<b>4</b>	<b>A.C Fundamentals</b>	10	15				
4.1	Frequency, Time Period, Phase Angle , R.M.S & Average value calculation of A.C waveforms	2		2	40%	40%	20%
4.2	Phasor representation of alternating quantities. Inductor & capacitor phase relationships	2		2	40%	40%	20%
4.3	Rectangular and polar forms of A.C quantities	2		3	40%	40%	20%
4.4	Impedance, Phasor diagram and Power triangle calculation in Series and parallel combination of R-L, R-C and R-L-C circuit	2		2	40%	40%	20%
4.5	Introduction to Three Phase AC Circuit, Star, Delta connection, 2 wattmeter method.	2		2	40%	40%	20%
<b>5</b>	<b>Resonance</b>	08	15				
5.1	Resonance in series RLC circuit.	2		2	30%	30%	40%
5.2	Resonance in parallel RLC circuit.	2		2	30%	30%	40%
5.3	Concept of Impedance and Resonance Frequency.	2		2	30%	30%	40%
5.4	Power Factor & Quality factor calculation in series & parallel resonance network	2		3	30%	30%	40%
<b>6</b>	<b>Introduction to transformer and motors</b>	06	10				
6.1	Transformer types and working principle	2		1	50%	40%	10%



6.2	Working principle and constructions of types of DC motors	2		1	50%	40%	10%
6.3	Introduction of AC motors, stepper motors	2		2	50%	40%	10%

*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.*

### LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1.	2	Determine the loop currents in any DC network	2	1,3
2.	2	Determine the node voltages in any DC network	2	1,3
3.	3	Verification of principle of superposition with DC sources.	2	1,3
4.	3	Verification of Thevenin's theorems in DC circuits	2	1,3
5.	3	Verification of Norton theorems in DC circuits	2	1,3
6.	3	Verification of Maximum power transfer theorems in DC circuits	2	1,3
7.		Introduction to Circuit Simulation Software.	2	2
8.	4	Analysis of single phase circuits using resistor, inductor & capacitor elements (Circuit Simulation Software)	2	2
9.	5	Study of RLC series resonance	1	2
10.	5	Study of RLC Parallel resonance	1	2
11.	6	Working of transformer and three phase induction motor(Demo type)	3	2

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

### SUGGESTED SELF LEARNING ASSIGNMENTS/MICROPROJECT/ACTIVITIES

#### Assignments (if any)

- Assignments based on Nodal and Mesh analysis.
- Assignments on Network Theorem, AC Fundamentals and Resonance.
- Collect real life examples where Ohms and kirchoffs law is applicable.

### ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Assignments/ Tutorials





- Midterm Test Exam
- Term Work
- Observational Assessment

Summative Assessment (Assessment of Learning)

- End Term Exam.
- Oral Examinations/Vivas.
- Practical Examinations.

### SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	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	PSO-1	PSO-2	PSO-3
CO1	3	1	-	-	1	-	2	1	1	
CO2	3	2	-	1	-	-	1	1	-	
CO3	2	3	1	1	-	-	1	1	-	

Legends :- High:03, Medium:02,Low:01, No Mapping: -

### SUGGESTED LEARNING MATERIALS / BOOKS

Sr. No.	Author	Title	Publisher and Edition
1	M. E. Van Valkenburg	Network Analysis	3rd Edition, PHI Learning
2	W H Hayt, S M Durbin, J E Kemmerly	Engineering Circuit Analysis	7th Edition, Tata McGraw-Hill Education.
3	D. Roy Choudhury	Networks and Systems	2nd Edition, New Age International.
4	F. F. Kuo, John Wiley and sons.	Network Analysis and synthesis	
5	N Balabanian and T.A. Bickart,	Linear Network Theory: Analysis, Properties, Design and Synthesis'	Matrix Publishers, Inc.
6	C. L. Wadhwa	Network Analysis and synthesis	New Age international.
7	B. Somanathan Nair	Network Analysis and Synthesis	Elsevier Publications



## LEARNING WEBSITES & PORTALS

Sr. No.	Link/Portal	Description
1	<a href="https://www.hansrajcollege.ac.in/hCPanel/uploads/elearning/elearning_document/bsc-2nd_year_unit-2.pdf">https://www.hansrajcollege.ac.in/hCPanel/uploads/elearning/elearning_document/bsc-2nd_year_unit-2.pdf</a>	Electrical Circuits & network Skills
2	<a href="https://www.electronicshub.org/introduction-to-transformers/">https://www.electronicshub.org/introduction-to-transformers/</a>	Basics of Transformer
3	<a href="https://www.iqsdirectory.com/articles/electric-motor/dc-motors.html">https://www.iqsdirectory.com/articles/electric-motor/dc-motors.html</a>	DC Motors
4	<a href="https://nptel.ac.in/courses/108105112">https://nptel.ac.in/courses/108105112</a>	NPTEL Study Materials
5	<a href="https://www.electrical4U.com">https://www.electrical4U.com</a>	All about Electrical Circuits

  
Curriculum Coordinator

  
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Dean Diploma



BOS VJTI Approval Dt. 01/08/2023



DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRONICS ENGINEERING
PROGRAMME CODE	: DELNE
SEMESTER	: SECOND
COURSE TITLE	: BASICS OF ELECTRONICS
COURSE CODE	: 233EX24

### TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME						EXAMINATION SCHEME											
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
							Max	Min	Max	Min	FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max					Min	Max	Min	Max	Min	Max	
3	-	2	1	3	3	30	70	28	100	40	-	-	25	10	25	10	150

### COURSE OBJECTIVES

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

### COURSE OUTCOMES (COS)

Students will be able to achieve the following COS on completion of course based learning

CO1- Comprehensively analyze the theory of Semiconductors and grasp the operation as well as the characteristics of p-n junction diodes and Zener diodes.

CO2- Elucidate the construction, working principles, and applications of optoelectronic devices.

CO3- Develop skills in building, troubleshooting, and applying various number systems in digital design.

### COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION - I							
Unit & Sub-Unit	Topics/Sub-topics	Hrs	Marks	COS	R Level	U Level	A Level
1	Semiconductor Basics	03	07				



1.1	Comparative study of conductor, insulator and semiconductor. Vacuum tube and their functions	1	4	1	50%	30%	20%
1.2	Classification of Semiconductor Diodes	1	2	1	50%	30%	20%
1.3	Energy band and Effect of temperature.	1	1	1	50%	30%	20%
<b>2</b>	<b>PN Junction Diode</b>	<b>13</b>	<b>25</b>				
2.1	P-N junction diode, formation of depletion region, Diffusion process.	5	10	1	10%	20%	70%
2.2	Operation of p-n junction diode in Forward bias and reverse bias condition.	3	5	1	10%	20%	70%
2.3	Operation of Zener diode diode in Forward bias and reverse bias condition.	2	4	1	10%	20%	70%
2.4	V-I Characteristics, Advantages, Disadvantage and Application of p-n junction diode and Zener Diode.	1	2	1	10%	20%	70%
2.5	Specification (rating) of p-n junction diode and Zener Diode.	1	2	1	10%	20%	70%
2.6	Zener diode as Voltage Regulation Circuit.	1	2	1	10%	20%	70%
<b>3</b>	<b>Optoelectronic Devices</b>	<b>04</b>	<b>08</b>				
3.1	Photodiode, Solar cell, Photoconductive cell, their Construction, working, advantages, disadvantages, and Application.	2	4	2	10%	20%	70%
3.2	Light emitting diode, seven segment display, infra-red LED, their Construction, working, advantages, disadvantages and Application.	1	2	2	10%	20%	70%
3.3	Liquid Crystal Display, Optocouplers their Construction, working, advantages, disadvantages and Application	1	2	2	10%	20%	70%

### SECTION - II

Unit & Sub-Unit	Topics/Sub-topics	Hrs	Marks	COS	R Level	U Level	A Level
<b>4</b>	<b>Introduction, Number Systems, Codes</b>	<b>12</b>	<b>13</b>				
4.1	Digital number system, 9's & 10's complement and its arithmetic operation	4	5	3	10%	20%	70%



4.2	Conversion between decimal, binary, octal & Hexadecimal numbers	3	3	3	10%	20%	70%
4.3	Binary Number system and its arithmetic operation and 1's & 2's complements	3	3	3	10%	20%	70%
4.4	BCD 8421 code, 9's & 10's complement, BCD arithmetic, Excess – 3, Gray.	2	2	3	10%	20%	70%
<b>5</b>	<b>Logic Gates</b>	05	15				
5.1	Boolean expression and Logic Diagrams of AND, OR, NOT, NAND, NOR, EX –OR, EX-NOR Gates.	2	5	3	10%	20%	70%
5.2	Boolean Algebra: Operations, Laws & Rules. DeMorgan's Theorems.	1	5	3	10%	20%	70%
5.3	Simplification and Implementation of Logic Expression by using Boolean Algebra.	1	3	3	10%	20%	70%
5.4	NAND & NOR used as universal gates.	1	2	3	10%	20%	70%
<b>6</b>	<b>Combinational Logic Circuits</b>	10	12				
6.1	Expansion of Boolean expression to Sum -Of-Products (SOP) & Product-Of-Sums (POS) forms, their conversion to standard forms.	4	4	3	10%	20%	70%
6.2	2, 3 and 4 input variables function of Karnaugh map. Mapping and minimization of SOP expression.	4	4	3	20%	70%	10%
6.3	Don't Care Condition in Karnaugh map reduction Troubleshooting of logic circuits.	4	4	3	20%	70%	10%

*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.*

#### LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS

Sr. No.	Practical/Assignment/Tutorial Title	No. of Hours	Relevant COS
1	Explore the V-I Characteristics of P-N junction Diode.	2	1
2	Investigate the V-I Characteristics of Zener Diode.	2	1



3	Examine the V-I Characteristics of Light Emitting Diode (Red, Green, Yellow and Blue color ).	2	2
4	Validate the truth table of TTL logic gate IC's 7432, 7486.	2	3
5	Confirm the truth table of TTL logic gate IC's 7408,7400, 7402.	2	3
6	Demonstrate the NAND and NOT Gate as universal Gate.	2	3
7	Implement the design of Half adder and Full adder using Karnaugh map reduction.	2	3
8	Implement the design of Half subtractor and Full subtractor using Karnaugh map reduction.	2	3
9	Validate the design of 4-bit Parallel adder subtractor using Karnaugh map reduction.	2	3
10	Validate the design of BCD adder subtractor using Karnaugh map reduction.	2	3
* Minimum 8 and maximum 12 practicals/ experiment sessions to be included in a course in a term			

### SUGGESTED SELF LEARNING ASSIGNMENTS/MICROPROJECT/ACTIVITIES Assignments

- Collect examples based on real world applications and prepare a pdf file
- Collect at least 10 examples based on real world applications of Normal diode & Zener diode.

### ASSESSMENTS 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



### SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	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	PSO-1	PSO-2	PSO-3
CO1	2	-	-	-	-	-	2	2	1	1
CO2	1	-	-	2	-	-	2	2	1	1
CO3	2	1	1	-	-	2	2	2	1	1

Legends :- High:03, Medium:02,Low:01, No Mapping: - 0

### SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

No	Author	Title	Publisher
1	Robert Boylestad & Louis Nashelsky,	Electronic Devices and Circuit Theory,9th Edition	Prentice Hall India Private Limited
2	A. Anand Kumar	Fundamentals of Digital Circuits,3rd Edition	Prentice Hall India Private Limited
3	Albert Paul Malvino.	Electronic Principles,7th Edition.	Tata McGraw - Hill Publishing Company Ltd.
4	David Bell.	Electronic Devices and Circuits, 5th Edition.	Oxford University Press.
5	R.P. Jain,	Modern Digital Electronics, 4th Edition	Tata McGraw - Hill Publishing Company Ltd.
6	Thomas L. Floyd,	Digital Fundamentals by 8th Edition.	Pearson Education Inc.



## SOFTWARE/LEARNING WEBSITES

1. [www.nptel.iitm.ac.in](http://www.nptel.iitm.ac.in)
2. [www.datasheetcafe.com](http://www.datasheetcafe.com)
3. [www.williamson-labs.com](http://www.williamson-labs.com)
4. [www.futurelec.com](http://www.futurelec.com)
5. [www.bis.org.in](http://www.bis.org.in)
6. [www.learnerstv.com](http://www.learnerstv.com)
7. [www.cadsoft.io](http://www.cadsoft.io)
8. [www.khanacademy.com](http://www.khanacademy.com)

  
Curriculum Coordinator

  
Head of the Department

  
Dean Diploma



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BOS VJTI Approval Dt. 01/08/2023





DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRONICS ENGINEERING
PROGRAMME CODE	: DELNE
SEMESTER	: SECOND
COURSE TITLE	: OBJECT ORIENTED PROGRAMMING USING C++
COURSE CODE	: 233EX25

### TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME						EXAMINATION SCHEME											
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
							Max	Min	Max	Min	FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max					Min	Max	Min	Max	Min	Max	
3	-	2	-	2.5	3	30	70	28	100	40	25	10	25	10	-	-	150

### COURSE OBJECTIVES

To teach students basic facts, concepts and principles of C++ programming as a tool to analyze engineering problems. To make students well versed in the prerequisites for further studies in electronics engineering.

### COURSE OUTCOMES (COS)

Students will be able to achieve the following COS on completion of course based learning

CO1- Basics of C++ language such as declaration initialization of variables data types and Solving problems bases on object-oriented programming.

CO2 - Debug and edit programs using classes and objects.

CO3 - Implement inheritance and use Polymorphism, file handling and exceptional handling in programs.



## COURSE CONTENTS WITH SPECIFICATION TABLE

Unit & Sub-Unit	Topics/Sub-topics	Hrs	Marks	COS	R Level	U Level	A Level
<b>1</b>	<b>Introduction to OOPs</b>	<b>7</b>	<b>10</b>				
1.1	Concept and Features of OOPs	1		1	60%	20%	20%
1.2	Introduction of C++, C program verses C++	1		1	60%	20%	20%
1.3	Structure of 'C++' program	1		1	60%	20%	20%
1.4	Executing and debugging a 'C++' Program	1		1	60%	20%	20%
1.5	C++ Tokens and Type Casting: Keywords and Identifiers, Operators, Constants, Variables, Data Types, Precedence of Operators, Scope, and Lifetime of Variables	1		1	60%	20%	20%
1.6	Control structure: Decision making statements and loop	1		1	60%	20%	20%
1.7	Array, strings, and structures in C++	1					
<b>2</b>	<b>Classes &amp; Objects</b>	<b>10</b>	<b>15</b>				
2.1	Classes & Object Specifier, defining data members and member functions, Array of objects, Managing console I/O, C++ stream classes, Formatted and unformatted console I/O, Usage of manipulators	5	6	1,2,3	20%	60%	20%
2.2	Function: Function overloading and default arguments, Inline function, Static class members, Friend functions, Virtual Functions	3	5	1,2,3	20%	60%	20%
2.3	Constructors and Destructor: Concept of Constructor, Types of Constructors, Memory allocation (new and delete), use of Destructor	2	4	1,2,3	20%	60%	20%
<b>3</b>	<b>Inheritance</b>	<b>7</b>	<b>10</b>				
3.1	Types of inheritance	3	4	1,3	20%	60%	20%



3.2	Virtual base classes and abstract base classes	2	3	1,3	20%	60%	20%
3.3	Constructor and destructor in derived class	2	3	1,3	20%	60%	20%

SECTION – II							
Unit & Sub-Unit	Topics/Sub-topics	Hrs	Marks	COS	R Level	U Level	A Level
<b>4</b>	<b>Pointers and Polymorphism</b>	<b>10</b>	<b>15</b>				
4.1	Pointers arithmetic handling array using pointers, handling functions using pointers, handling	3	4	1,3	20%	60%	20%
4.2	Pointers to objects, 'this' pointer, Pointers to derived classes	3	4	1,3	20%	60%	20%
4.3	What is Polymorphism, Pure virtual functions, Virtual Base Class	2	3	1,3	20%	60%	20%
4.4	Overloading Unary and Binary operators, Overloading using friend function	2	4	1,3	20%	60%	20%
<b>5</b>	<b>Working with files</b>	<b>7</b>	<b>10</b>				
5.1	File operations: opening, closing reading and writing	4	4	1,3	20%	60%	20%
5.2	File pointer and their manipulation	2	3	1,3	20%	60%	20%
5.3	File updating with random access	1	3	1,3	20%	60%	20%
<b>6</b>	<b>Exception Handling</b>	<b>7</b>	<b>10</b>				
6.1	Various Exception Handling classes	3	4	1,3	20%	60%	20%
6.2	Implementing try and catch block	2	3	1,3	20%	60%	20%
6.3	Use of throw keyword	2	3	1,3	20%	60%	20%

*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.*



## LIST OF PRACTICALS

Sr. No.	Practical	No. of Hrs	Relevant COS
1	Develop minimum 02 programs using constant, variables, arithmetic expression, operators, exhibiting data type conversion	2	1
2	Develop a program to implement decision making statements (If-else, Switch).	2	1
3	Develop a program to demonstrate control structures (for, while, do-while)	2	1
4	Develop a program to implement 1 dimension array and using multi-dimensional array	2	1
5	Develop a program to implements a class and use it with objects.	2	1,2
6	Develop a program that implements class and create array of objects	2	1,2
7	Write a program to implement friend function	1	1,2
8	Write a program to implement inline function.	1	1,2
9	Write a program to implement all types of constructors, (constructor overloading) with destructor	2	1,2
10	Write a program for implementing single inheritance	2	1,3
11	Write a program for implementing multilevel inheritance	2	1,3
12	Write a program for implementing multiple inheritance	2	1,3
13	Develop program to demonstrate pointer to object	2	1,3
14	Develop program to demonstrate point to derived class	2	1,3
15	Write a program to demonstrate operator overloading for unary operator	2	1,3
16	Write a program to demonstrate function overloading.	2	1,3
17	Write a program to read and write data to and from a file.	2	1,3

## SUGGESTED SELF LEARNING ASSIGNMENTS/MICROPROJECT/ACTIVITIES

### Assignments

- Solve assignments suggested by teacher.
- Develop C++ code for relevant topics suggested by teacher.

### Micro Project (if any)

- Develop simple real world C++ application projects.



## ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Experiment performance and journal completion.
- Midterm Test Exam
- Class Test.
- Term Work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- End Term Exam
- Micro-project/Assignments

## SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	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	PSO-1	PSO-2	PSO-3
CO1	3	1	-	2	-	1	1	0	1	2
CO2	3	2	-	2	-	2	1	0	2	2
CO3	3	3	3	3	1	3	1	0	2	3

Legends: - High:03, Medium:02, Low:01, No Mapping: - 0

## SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

Sr. No	Author	Title	Publisher
1	Balaguruswamy	Object Oriented Program with C++	Tata McGraw-Hill Publishing Limited
2	Bjarne Stroustrup	The C++ Programming Language	3 <sup>rd</sup> edition, Addison-Wesley Longman
3	Herbert Schildt	C++ complete reference	McGraw-Hill, Osborne Media



## LEARNING WEBSITES AND PORTALS

1. <http://www.nptel.ac.in>
2. <https://www.khanacademy.org>
3. [https://www.tutorialspoint.com/cplusplus/cpp\\_object\\_oriented.htm](https://www.tutorialspoint.com/cplusplus/cpp_object_oriented.htm)
4. <https://www.studytonight.com/cpp/cpp-and-oops-concepts.php>

  
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Head of the Department

  
Dean Diploma



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BOS VJTI Approval Dt. 01/08/2023



DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRONICS ENGINEERING
PROGRAMME CODE	: DELNE
SEMESTER	: SECOND
COURSE TITLE	: ENVIRONMENTAL STUDIES
COURSE CODE	: 233EX26

### TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME													
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)			TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
												FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min		
2	-	-	2	2	-	-	-	-	-	-	25@	10	-	-	25@	10	50	

### COURSE OBJECTIVES

To impart knowledge about renewable and non-renewable natural resources. To understand and appreciate the concept of ecosystems, biodiversity and conservation. To increase the awareness regarding environmental pollution, climate change, water conservation and environmental legislations.

### COURSE OUTCOMES (COS)

Students will be able to achieve the following COS on completion of course based learning

**CO1-** Identify and classify the different natural resources and ecosystems with environmental impacts of human activities on it.

**CO2-** Understand the core concept of pollution, pollutants, biodiversity and estimate the importance of biodiversity and its conservation.

**CO3-** Design methods to reduce pollution, population and use the information regarding environmental legislation to improve their surroundings for the betterment of the community.



**COURSE CONTENTS WITH SPECIFICATION TABLE**

SECTION I							
Unit & Sub-Unit	Topics/Sub-topics	Hrs	Marks	CO	R Level	U Level	A Level
<b>1</b>	<b>Multidisciplinary nature of environmental studies</b>	<b>2</b>		<b>1,2,3</b>	<b>40%</b>	<b>50%</b>	<b>10%</b>
1.1	Definition, need, scope and importance.			1			
1.2	Segments of environment.			1			
1.3	Environmental issues & public awareness.			2			
1.4	Concept of 4Rs – Reduce, Reuse, Recycle, Recover			3			
<b>2</b>	<b>Natural Resources</b>	<b>8</b>		<b>1,2,3</b>	<b>20%</b>	<b>50%</b>	<b>30%</b>
2.1	Cyclic, Renewable and non-renewable resources.			1			
2.2	Types of Natural resources and associated problems with case study. a) Forest resources: Use and over-exploitation, deforestation. b) Water resources: Use and over-utilization of surface and ground water, floods, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. d) Food resources: World food problems, changes caused by agriculture and effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. e) Energy resources: Growing energy needs, use of alternate energy sources. f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.			1,2,3			
2.3	Cause and effects of depletion of resources with conservation of natural resources.			1			
2.4	Energy forms: Conventional and non-conventional.			1			





<b>3</b>	<b>Ecosystems</b>	<b>6</b>		<b>1,2</b>	<b>60%</b>	<b>40%</b>	
3.1	Definition, structure and function of an ecosystem.			1			
3.2	Producers, consumers and decomposers.			1			
3.3	Energy flow in the ecosystem, Ecological succession			2			
3.4	Food chains, food webs and ecological pyramids.			2			
3.5	Types of ecosystem with its functions, structure and characteristic features.			1			
<b>4</b>	<b>Biodiversity and its conservation</b>	<b>8</b>		<b>1,2,3</b>	<b>20%</b>	<b>60%</b>	<b>20%</b>
4.1	Definition & different levels of biodiversity.			1			
4.2	Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.			2			
4.3	India as a mega-diversity nation.			2			
4.4	Biodiversity hotspots and their conservation.			1			
4.5	Threats to Biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.			3			

## SECTION II

Unit & Sub-Unit	Topics/Sub-topics	Hrs	Marks	CO	R Level	U Level	A Level
<b>5</b>	<b>Environmental Pollution.</b>	<b>8</b>		<b>1,2,3</b>	<b>20%</b>	<b>40%</b>	<b>40%</b>
5.1	Definition, different types with its causes & effects			1			
5.2	Nuclear hazards, solid waste, E-waste, biological waste: Generation, effects and control measures.			2			
5.3	Role of an individual in prevention of pollution with its case studies.			3			
<b>6</b>	<b>Social Issues and the Environment</b>	<b>7</b>		<b>1,2,3</b>	<b>30%</b>	<b>40%</b>	<b>30%</b>
6.1	Water conservation, rain water harvesting, ground water recharge.			1			



6.2	Climate change, global warming, acid rain, ozone layer depletion & nuclear accidents. Case Studies.			3			
6.3	Urban problems related to energy.			2			
6.4	Resettlement and rehabilitation of people; its problems and concerns.			3			
6.5	Environmental ethics: Issues and possible solutions, wasteland reclamation.			2			
6.6	Different environment acts.			1			
<b>7</b>	<b>Human Population and the Environment</b>	<b>6</b>		<b>1,2,3</b>	<b>40%</b>	<b>40%</b>	<b>20%</b>
7.1	Population growth, Population explosion – Family Welfare Programme.			1			
7.2	Effect of Environment on human health.			2			
7.3	Human Rights. Value Education. Women and Child Welfare.			1			
7.4	Role of Information Technology in Environment and human health.			3			
<b>8</b>	<b>Field work</b>	<b>3</b>		<b>1,2,3</b>	<b>10%</b>	<b>40%</b>	<b>50%</b>
8.1	Visit to a local area to document environmental assets- river/forest/grassland/hill/mountain.			3			
8.2	Visit to a local polluted site- Urban/Rural/Industrial/Agricultural			3			
8.3	Study of common plants, insects, birds.			1			
8.4	Study of simple ecosystems-pond, river, hill slopes, etc. (Field work equal to 5 lecture hours)			2			



### LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS

Sr. No.	Practical/Assignment	No. of Hours	Relevant COS
1	Visit to a local area to document environmental assets river/ forest/grassland/hill/mountain	-	2,3
2	Visit to a local polluted site – Urban / Rural / Industrial / Agricultural	-	2,3
3	Study of common plants, insects, birds	-	1,2
4	Study of simple ecosystems-pond, river, hill slopes, etc	-	2,3

### SUGGESTED SELF LEARNING ASSIGNMENTS/MICROPROJECT/ACTIVITIES

#### Assignments (if any)

- Assignments based on Environmental Issues and their root causes.
- Assignments on Impact of an Individual to prevent the Pollution.
- Case study on 2-3 methods of Household waste recycling.

### ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Self-learning
- Term Work
- Seminar/Presentation

### SUGGESTED LEARNING MATERIALS / BOOKS

Sr. No.	Author	Title	Publisher and Edition
1.	Anandita Basak	Environmental studies	Dring Kindersley(India)Pvt. Ltd Pearson
2.	D.D. Mishra	Fundamental concepts in Environmental studies	S. Chand & Co. Ltd.
3.	Jain and Jain	Role of Tech. in Environment and Health	Dhanpat Rai Publishing Co. New Delhi
4.	Erach Bharucha	Text book of Environmental studies	UGC Press



## LEARNING WEBSITES & PORTALS

Sr. No.	Link/Portals	Description
1.	<a href="https://www.ugc.gov.in/oldpdf/modelcurriculum/env.pdf">https://www.ugc.gov.in/oldpdf/modelcurriculum/env.pdf</a>	Study Material
2.	<a href="https://www.hzu.edu.in/bed/E%20V%20S.pdf">https://www.hzu.edu.in/bed/E%20V%20S.pdf</a>	Environmental Science

  
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DIPLOMA PROGRAMME	: DIPLOMA IN ELECTRONICS ENGINEERING
PROGRAMME CODE	: DELNE
SEMESTER	: SECOND
COURSE TITLE	: TECHNICAL COMMUNICATION AND PRESENTATION SKILLS
COURSE CODE	: 233HM27

### I. TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME													
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)			TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
							Max	Max	Min	Max	Min	FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max						Min	Max	Min	Max	Min	Max	
1	1	2	-	2	-	-	-	-	-	-	-	25	10	25	10	-	-	50

### II. RATIONALE:

Developing Presentation Skills by enhancing communication skills. Students will get exposure to leadership qualities (problem-solving attitude) by participating in different curriculum activities. All these will enhance their confidence and build a good language.

Making students proficient in oral skills through various activities that will enable them to perform efficiently during interviews, meetings, seminars, conferences, group discussions, in negotiations, and conflict solutions. Giving exposure to self-learning by providing enough materials through the language laboratory's ETNL software and open source software. Improving technical communication through report writing, email drafting, and critical analysis of a situation, drawing appropriate conclusions, and presenting them precisely. Enhancing their Reading, Writing, Speaking, and Listening skills (RWSL) in the English language effectively. Developing the personality of future technologists by inculcating proper interactive skills in them and improving their power of expression required for efficacious communication in the verbal and non-verbal form to achieve success in professional life.

### III. COURSE OUTCOMES (COs)

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

CO1 – Enhancing speaking skills and self-confidence



CO2 – Developing analytical ability and technical communication skills

CO3 - Developing interactive skills and power of expression

#### IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION - I							
Unit & Sub-Unit	Topics/Sub-topics	Hrs	Marks	COS	R Level	U Level	A Level
1	<b>I. ORAL SKILLS</b>	08	05	CO1	30%	30%	40%
	Dialogue and Role Play Group Discussion Elocution Extempore Presentation Skills JAM (Just A Minute talk)						
2	<b>II. TECHNICAL COMMUNICATION</b>	06	05	CO2	20%	20%	60%
2.1	Editing & Critical-Analysis of articles / write up.						
2.2	Report Writing /Drafting proposals Drafting Email, Notices, Minutes of a Meeting, Resume Writing						
3	<b>LISTENING AND INTERACTIVE SKILLS: Language Laboratory</b>	08	05	CO1	30%	30%	40%
3.1	Phonetics						
3.2	Audio-visual Communication Videos on Intonation and pronunciation Rise and fall of syllables in the language						
3.3	Power Point Presentation techniques						
4	<b>Persuasive Communication and Body language</b>	05	05	CO3	30	30	40



	4.1	<ul style="list-style-type: none"> <li>• Kinesics</li> <li>• Haptics</li> <li>• Proxemics</li> <li>• Vocalics</li> <li>• Chronemics</li> </ul>						
	4.2	Manners and Etiquette <ul style="list-style-type: none"> <li>• Table Manners</li> <li>• Telephone &amp; Email Etiquettes</li> </ul>						
5		<b>SOFT SKILLS</b>	05	05	CO3	20%	60%	20%
5.1		Life skills: Self-awareness and Self-analysis, Adaptability, Resilience, Emotional Intelligence and Empathy, Self Esteem, etc.						
<b>Legends:</b> R- Remember, U – Understand, A – Apply and above levels (Blooms’s Revised Taxonomy).								

#### V. LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS

Sr. No.	Practical/Assignment/Tutorial Title	No. of Hrs	Relevant COs
1	Writing and delivering a speech.	2	CO1
2	Conducting group discussion on a given topic representing teamwork	2	CO2
3	Writing a critical analysis of an article that requires critical thinking	2	CO1
4	Writing short reports/ Newspaper reports	2	CO2
5	Drafting emails	2	CO2
6	Drafting cover letters as per industry situations along with application	2	CO2
7	Resume Writing	2	CO3
8	Interview Skills -Mock Interviews	2	CO3
9	PowerPoint Presentation	2	CO3
10	Phonetics exercises in the language laboratory	2	CO3

#### VI. ASSESSMENTS 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
- Tutorial Performance

### VII. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)	
	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	PSO-1	PSO-2
CO1	3	2	2	-	3		2	2	2
CO2	3	2	2	-	3		2	2	2
CO3	3	2	2	-	3		2	2	2
CO4									

Legends :- High:03, Medium:02,Low:01, No Mapping: -

PSO1: Ability to apply knowledge of selecting raw materials, machines and process parameters using standard methods and engineering tools for designing solutions to meet specific needs of the textile industry.

PSO2: Understand the impact of textile processes in societal and environmental context and demonstrate the knowledge for sustainable development through teamwork and effective communication for lifelong learning.





### VIII. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

Sr. No	Author	Title	Publisher
1	Board of Editors N. A Lavande, V.H. Sawant, S R Madan, KB Laghane and Santosh Lomte	Written and Spoken Communication in English	Universities Press, 2007
2	Dr. Jagdish Saboo, Dr. Vivek Vishwarupe, Dr. Ravindra Nistane & Prof. Dimple Mapari	Plumage Communication Skills in English	Orient BlackSwan,2017
3	English and Soft Skills Volume 2	S. P. Dhanavel	Orient BlackSwan,2019
4	Gupta C. B.	Contemporary Management	APH, New Delhi, First edition, 1992
5	Sekaran Uma	Organisational Behaviour	Tata Mcgraw Hill, New Delhi, Second edition,2008
6.	Raman Meenakshi, Sharma Sangeeta	Technical Communication	OUP, India, Second impression, 2004

### IX. LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	<a href="http://www.newagegolden.com">www.newagegolden.com</a>	Refer to this website for speech writing, diary entry, and paragraph writing
2	<a href="http://grammarly.com/blog">grammarly.com/blog</a>	For constructing effective paragraphs and improving clarity
3	International Phonetic Association (IPA) Website	It offers audio examples and charts to help understand and transcribe sounds

  
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DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DELNE
SEMESTER	: SECOND
COURSE TITLE	: SOCIAL AND LIFE SKILLS
COURSE CODE	: 233EX28

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME						EXAMINATION SCHEME												
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS	
							Max	Min	Max	Min	FA-PR (CA)		SA-PR (PR/OR)		SLA			
											Max	Min	Max	Min	Max	Min		
-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	50	20	50

I. 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.

Note: The course offers five different alternatives(modules) for achieving above outcomes. Students must complete any one module from the following givenoptions.

- a. **MODULE-I: Unnat Maharashtra Abhiyan (UMA)**
- b. **MODULE-II: National Service Scheme (NSS)**
- c. **MODULE-III: Universal Human Values**
- d. **MODULE-IV: Value Education (Unnati Foundation)**
- e. **MODULE-V: Financial Literacy(NABARD)**



The institute can choose to offer any one MODULE to the groups of the students by taking into consideration the resources required and resources available in the institute. Different group of students may be offered different MODULE based on their choices.

## II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Demonstrate critical social and life skills ethics, resilience, positive attitude, integrity and self-confidence at workplace and society at large.

## III. COURSE LEVEL LEARNING OUTCOMES (COS)

Students will be able to achieve & demonstrate the following COs on completion of course based learning  
**CO1** - Enhance the ability to be fully self-aware and take challenges by overcoming all fears and insecurities and grow fully.

**CO2** - Increase self-knowledge and awareness of emotional skills and emotional intelligence at the place of study/work.

**CO3** - Provide the opportunity to realizing self-potential through practical experience while working individually or in group.

**CO4** - Develop interpersonal skills and adopt good leadership behaviour for self-empowerment and empowerment of others.

**CO5**- Set appropriate life goals with managing stress and time effectively.

## COURSE CONTENTS:

Sr. No.	MODULE	Implementation guidelines
1	<b>MODULE I: Activities Under Unnat Maharashtra Abhiyan (UMA)</b> 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	<u>Implementation guidelines suggested</u>  The course will be implemented in eight sessions and fieldwork:  a) Session I - Introduction to development paradigm, fieldwork and case study as pedagogy b) Session II - VII - Society, stakeholders and value creation, measurements, rudimentary analysis and reporting c) Session VIII - Final closure session feedback and assessment d) Field work – 1. Pilot Visit - Pilot of survey instrument



<p>data, road network data etc</p> <p>1.5 Problem Outline and stakeholders: Importance of activity and connection with Mapping of system components and stakeholders (engineering / societal)</p> <p>1.6 Key attributes of measurement,</p> <p>1.7 Various instruments used for data collection - survey templates, simple measuring equipments.</p> <p>1.8 Format for measurement of identified attributes/ survey form and piloting of the same.</p> <p>1.9 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</p> <p>1.10 Analysis and Report writing Report writing containing-</p> <ol style="list-style-type: none"> <li>1. Introduction of the topic.</li> <li>2. Data collected in various formats such as table, pie chart, bar graph etc.</li> <li>3. Observations of field visits and data collected.</li> </ol>	<p>2. Survey Visit 1 - Data gathering / Information Collection</p> <p>3. Survey Visit 2 - Data gathering</p> <p>4. Summary Visit - Closure after analysis</p> <p><b>Methodology:</b> Considering the nature of the course designed, following points shall be considered while implementing the course.</p> <p>i) Regroup in the batches of 5-6 students for conducting the fieldwork from the bigger group.</p> <p>ii) Assign a few batches of the students for this course to all the faculty members.</p> <p>iii) A group of course teachers will visit local governance bodies such as Municipal Corporations, Village Panchayats, Zilla Parishads, Panchayat Samitis to assess the small technological / engineering needs in their area of work.</p> <p>iv) The group of course teachers will carry out initial field visits to evaluate the various possibilities of field visits / various scenarios where in students can conduct field work to measure / quantify the parameters / attributes.</p>
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