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

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PROGRAMME NAME: DIPLOMA IN MECHANICAL ENGINEERING

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

Learning Scheme / Assessment Scheme

Sr No	Course Title	Abbreviations	Course Type	Course Code	Total IKS Hrs for Sem.	Actual Contact Hrs./Week CL	TL	LL	Self-Learning (Term Work + Assignment)	Notional Learning Hrs./Week	Credits	Paper Duration (hrs.)	Theory FA-TH (MST) Max	SA-TH Max	SA-TH Min	Total Max	Total Min	Based on LL & TL Practical FA (CA) Max	FA (CA) Min	SA (PR/OR) Max	SA (PR/OR) Min	Based on Self Learning SLA Max	SLA Min	Total Marks
1	MATHEMATICS -II	MS-II	AEC	234MA21	2	3	2	-	-	5	2.5	3	30	70	28	100	40	25	10	-	-	-	-	125
2	CHEMISTRY	CHY	DSC	234CH22	4	3	-	2	-	5	2.5	3	30	70	28	100	40	25	10	25@	10	-	-	150
3	MECHANICS OF SOLIDS-I	MOS-I	DSC	234ME23	2	4	1	-	-	5	2.5	3	30	70	28	100	40	25	10	-	-	-	-	125
4	ENGINEERING GRAPHICS-II	EG-II	DSC	234ME24	2	2	-	4	2	4	4	3	30	70	28	100	40	25	10	-	-	25	10	150
5	BASICS OF ELECTRICAL AND ELCTRONICS ENGINEERING	BEE	DSC	234EE25	2	4	-	2	2	8	4	3	30	70	28	100	40	25	10	25@	10	25	10	175
6	MECHANICAL WORKSHOP PRACTICES-II	MWP-II	SEC	234ME26	2	1	-	3	-	4	2	-	-	-	-	-	-	25	10	25@	10	-	-	50
7	COMPUTER AIDED DRAFTING	CAD	SEC	234ME27	1	1	-	2	-	3	1.5	-	-	-	-	-	-	25	10	25@	10	-	-	50
8	SOCIAL LIFE SKILLS	SLS	VEC	234ME28	-	-	-	-	2	2	1	-	-	-	-	-	-	-	-	-	-	50	20	50
	Total				15	18	3	13	6	40	20		150	350		500		175		100		100		875

Curriculum Coordinator

Head Diploma in Mechanical Engineering

Dean - Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: MATHEMATICS-II
COURSE CODE	: 234MA21b

I. TEACHING AND EXAMINATION SCHEME

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

II. RATIONALE

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 (COs)

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

- 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 basics of statistics to solve the problems.

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IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION - I								
Unit & Sub-Unit		Topics/Subtopics	Hour s	Mark s	COs	R Level	U Leve l	A Leve l
1		Higher ordered derivative	2	3	1	40%	40%	20%
	1.1	Second ordered derivative of explicit functions						
2		Applications of Derivative	4	8	1	40%	40%	20%

Unit & Sub-Unit		Topics/Subtopics	Hours	Marks	COs	R Level	U Level	A Level
	2.1	Maxima and minima (simple numerical problems)						
	2.2	Tangent and normal						
3		Integration	12	24	1	40%	40%	20%
	3.1	Definition of integration. Integration of standard functions.						
	3.2	Theorems of integration. Simple problems based on standard results. $\int f(ax+b)dx$, $\int \frac{f'(x)}{f(x)}dx$						
	3.3	Methods of Integration 3.3.1 Integration of rational functions. ($\frac{1}{x^2+a^2}$, $\frac{1}{\sqrt{x^2+a^2}}$, $\sqrt{x^2+a^2}$ 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								
Unit & Sub-Unit		Topics/Subtopics	Hours	Marks	COs	R Level	U Level	A Level
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	7.1	Statistics	12	17	3	40%	40%	20%
	7.2	Mean, Standard Deviation using step deviation method. Variance and coefficient of variation.						
	7.3	Elementary Probability						
		7.3.1 Combination formula ^nC_r, meaning and evaluate type of problems						
		7.3.2 Sample space, Types of events						
		7.3.3 Definition of probability, simple problems						
		7.3.4 Conditional probability						
		7.3.5 Independent events						
		7.3.6 Multiplication theorem simple numerical problems						
		7.3.7 Addition theorem. simple numerical problems						

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

V. LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS

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

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 AND COS-PSOS 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	2	1	1	1	-	-	1	2	1
CO2	2	1	1	1	-	-	1	2	1
CO3	2	1	1	1	-	-	1	2	1

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

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

BOS VJTI Approval dated 5/3/2024

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: CHEMISTRY
COURSE CODE	: 234CH22

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 & Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	-	2.5	3	30	70	28	100	40	25	10	@25	10	-	-	150

II. RATIONALE

Chemistry is a basic science subject which is essential to all engineering courses. It gives knowledge of basic chemistry of atoms, molecules, acids, bases, salts, electrolytes etc and related chemical reactions for engineering applications. The core knowledge of Chemistry will bring awareness to students about the precautions & preventions to be taken to reduce the hazardous effects on environment and accidental risk. The knowledge for the utilization of water resources and fundamentals of corrosion resistance is important in troubleshooting of the problems related to hard water and material corrosion. Understanding of properties of helps in selecting appropriate materials such as polymers, superconductors for engineering applications. This subject will generate curiosity of carrying out further development in engineering field.

III COURSE OUTCOMES (COS)

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

CO1- Define atoms and superconductors

CO2 -. Explain properties and applications of electrochemical cells and polymers

CO3 - Describe methods to treat hardness of water and to control corrosion

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

		SECTION-I						
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Atomic Structure and Solution**	10	15	1	30%	40%	30%
	1.1	Definitions of Elements, atoms, Molecules, structure of atom, Definition of atomic number, atomic mass number, Isotopes and Isobars, Electronic configuration (till Atomic no. 18),						
	1.2	Definitions: atomic weight, equivalent weights of an element, Molecular weight, Mole in terms of number, mass, volume,						
	1.3	Definitions of acids, bases and salts, classical theory and Arrhenius theory, pH, pOH, pH scale, Numericals						
	1.4	Solution, Concentrations of solution: Grams per litre, Percentage by weight or volume, Normality, Morality, Molality, Numericals, Volumetric analysis, Titrations, Acid base titration, Redox titration						
2		**Redox Reactions and Electrochemistry**	08	10	2	40%	40%	20%
	2.1	Oxidation, Reduction (Electron transfer concept) Oxidising & reducing agents, Oxidation number, Numerical.						
	2.2	Electrochemistry, Electrochemical reactions, Construction and working						

		Topics/Sub-topics						
		of electrolytic cell,						
	2.3	Applications of electrolysis: electroplating & electrorefining						
	2.4	Electrochemical cells and batteries, Construction, working and applications of primary cell: dry cells, secondary cells, fuel cells						
3		**Water**	06	10	3	30%	40%	30%
	3.1	Introduction, Hard and soft water, hardness, types of hardness, its expression as calcium carbonate hardness, its units and its determination (EDTA method only).						
	3.2	Numerical on Hardness determination Disadvantage of use of hard water, boiler problems-scale, sludge their causes and						
	3.3	Water softening processes – Lime – Soda process, Zeolite Permutit method and Ion exchange method						

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

Unit & Sub-Unit		Topics/Sub-topics						
4		**Corrosion**	08	13	3	40%	40%	20%
	4.1	Introduction, Types of corrosion (dry and wet corrosion), Mechanism of dry and wet corrosion, factors affecting the corrosion,						
	4.2	Protective measures against corrosion: coatings (galvanic and zinc, organic coating agents,						

		Electroplating, metal cladding,).						
5		**Organic Chemistry and Polymers**	10	12	2	40%	40%	20%
	5.1	Introduction, Catenation property of Carbon element, Organic compounds, its properties and applications,						
	5.2	Polymer, Monomer, Polymerisation, Addition and condensation polymerisation, Plastics: definition, types: thermosetting & thermo softening plastics, compounding of plastics, properties and applications of plastics.						
	5.3	Rubber, structure of rubber, Natural rubber: preparation & properties, Vulcanization of rubber, properties of vulcanized rubber, synthetic rubber & its comparison with natural rubber. Properties and applications of rubbers.						
6		**Superconductors**	06	10	1	40%	40%	20%
	6.1	Introduction to superconductors, types, LTSC and HTSC, BCS theory for LTSC, HTSC, cuprates and non stoichiometric pervoskite structure,						
	6.2	structure and preparation of yttrium barium cuprates1: 2: 3 system, properties and uses of superconductors.						

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/ASSIGNBMENTS/TUTORIALS

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1	1	To study the use of indicators, for identification of acid, base and neutral solutions from the given set of solutions	2	1
2	1	To standardize HCl solution using N/10 Na2CO3.	2	1
3	2	To standardize KMnO4 solution using N/10 C2H2O4 solution.	2	2
4	1	To standardize EDTA solution using N/10 ZnSO4 solution.	2	1
5	1	To standardize AgNO3 solution using NaCl solution.	2	1
6	3	Estimation of Total hardness of water by EDTA complexometric titration	2	3
7	3	Estimation of Chloride (Cl⁻) content of tap water using Mohr's method	2	3
8	1	Determination of strength of mixture of ($H_2SO_4 + H_2C_2O_4$) solution	2	1
9	1	To determine the molecular weight of a given Monobasic acid by volumetric method	2	1
10	5	Viscosity by Redwood viscometer	2	2
* Minimum 8 and maximum 10 practicals/experiment sessions to be included in a course in a term				

VI. SUGGESTED SELF LEARNING ASSIGNMENT/ MICROPROJECT /ACTIVITIES

- Complete electronic configuration of first 25 elements along with symbol and atomic number.
- Make a list of commercial organic and inorganic acids and bases and draw their structures.

VII. ASSESMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)
- Midterm Test Exam
- Self-learning
- Term Work

Summative Assessment (Assessment of Learning)
- End Term Exam
- Practicals

VIII. SUGGESTED COS-POS AND COS-PSOS 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	-	-	-		1	2	-
CO2	2	1	-	-	-		1	2	-
CO3	2	2	-	-	1		1	2	-
Legends :- High:03, Medium:02,Low:01, No Mapping: -									

IX. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFRENCE BOOKS/WEBSITES

Sr. No.	Author	Title	Publisher and Edition
1		XIth standard Chemistry book	HSC Board, M.S. / NCERT
2		XIIth standard Chemistry book	HSC Board, M.S. / NCERT
3	Shashi Chawla	A Text Book of Engineering Chemistry	Educational & Technical Publishers Dhanpat Rai & Co. (Pvt.) Ltd, Edition: Third (2005)
4	Jain & Jain	Engineering Chemistry	Dhanpat Rai & Co. (Pvt.) Delhi – 110006 Ltd. Edition: (2008)
5	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)

X. LEARNING WEBSITES & PORTALS

Sr.No	Link / portal	Description
1	ww.onlinelibrary.wiley.com	Concepts of basic chemistry
2	https://www.chem1.com	Chemistry instruction and education

Curriculum Coordinator   Head of the Department   Dean Diploma

BOS VJTI Approval dated 5/3/2024

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: MECHANICS OF SOLIDS I
COURSE CODE	: 234ME23

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 CL & TL				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-OR		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
4	1	-	2	3.5	3	30	70	28	100	40	25	10	-	-	25	10	150

II. RATIONALE

This course in Mechanics of Solids-I is designed to cover the applications of the principles of Mechanics of Engineering in general and Mechanical engineering in particular. This deals with static forces on the structures and bodies in motion and principles of equilibrium and dynamics, kinematics and kinetics of particles.

The tutorial work covered under this course will provide suitable learning experiences to develop the desired abilities, skills and attitude to analyze and solve the problems encountered in Mechanical Engineering.

III. COURSE OUTCOMES (COS)

Student should be able to

CO1   Understand and define the fundamental concepts of Engineering Mechanics and apply the concept of resolution & composition of forces. Understand concept of equilibrium, free body diagrams, special supports, solve body reaction and beam reaction problems, by analytical and graphical method and solve problems on friction.

CO2   Understand the concept of kinematics and solve the numerical based on projectile and angular motion.

CO3   Understand the concept of kinetics and solve the numerical based on work, power and energy.

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

		SECTION-I						
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1	1.1	Fundamental concepts: Statics, Dynamics, Kinematics, Kinetics, Concept of force system of forces: Co-planar Concurrent, parallel, Principle of transmissibility of a force.	03	02	1	30	40	30
2	2.1	Resolution and Composition of forces: Resolution of a force, concept of a moment of a force, laws of moments and couples, Composition of co-planar, concurrent, non-concurrent, parallel forces, Resultant of a general system of co-planer forces.	07	11	1	30	40	30
3	3.1	Equilibrium: Definition, Relation between resultant & equilibrant, condition of equilibrium, Types of supports, roller, hinge & fixed. Free body diagrams.	08	11	1	30	30	40
4	4.1	Friction: Laws of friction, terms used: Co-efficient of friction, angle of friction, repose, equilibrium of bodies on level and inclined planes.	06	11	1	30	40	30
		SECTION-II						
Unit & Sub-Unit		Topics/Sub-topics						
		Kinematics and kinetics, principles of dynamics						
5	5.1	Newton's laws of motion (first law of	02	07	2	30	40	30

		motion, second law of motion, third law of motion). Motion of particle acted upon by a constant force, equations of motion.						
	5.1	Projectile: Review of rectilinear motion, Motion of projectile, Time of flight, Maximum height and horizontal range, relation between angle of projection and range, maximum horizontal range.	04	07	2	30	30	40
	5.2	Angular Motion: Definition, Angular displacement, Angular velocity, Angular acceleration, Tangential and Radial components equations of circular motion. Relative Motion.	06	07	2	30	40	30
6	6.1	D" Alembert"s principle. Work, Power and Energy: Definition of terms, form of energy, law of conservation of energy, Relation between force, mass & acceleration and its application.	09	07	3	30	30	40
7	7.1	Momentum and Impulse, law of conservation of linear momentum, law of conservation of energy, collision of elastic bodies, Newton"s law of collision of elastic bodies.	04	07	3	30	30	40
Numerical Questions will be asked on all of the above topics.								
Legends: R- Remember, U – Understand, A – Apply.								

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 ASSIGNBMENTS/TUTORIALS

Sr. No.	Unit	Assignments/ Tutorials	Approx. Hours	CO
1	1	Law of polygon of forces	2	1
2	3	Simple screw jack.	2	3
3	4	Differential axle and wheel	2	3
4	4.1	Resultant of concurrent forces.	2	1
	4.2	Resultant of parallel forces	2	1
5	5.1	Resultant of non-concurrent, non-parallel forces.	2	1
	5.2	Reactions of a simply supported beam.	2	1
6	6	Equilibrium of bodies.	2	1

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

- Assignments on numerical/problems on various topics given by subject teachers

VII. ASSESMENTS METHODOLOGIES /TOOLS

Formative Assessment (Assessment of Learning)
- Tutorials
- Mid semester test
- Timely practical journal completion

Summative Assessment (Assessment of Learning)
- End Term Exam

VIII. SUGGESTED COS-POS AND COS-PSOS 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	2	1	1	1	-	-	1	2	1
CO2	2	1	1	1	-	-	1	2	1
CO3	2	1	1	1	-	-	1	2	1

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

IX. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFRENCE BOOKS/WEBSITES

Sr. No.	Author	Title	Publisher and Edition
01	S. B. Junnarkar,	Applied mechanics	17th edition ,Revised, 2010, Publisher- Charotar Publishing House Pvt. Ltd.
02	R. K. BANSAL	Engineering mechanics	3rd Revised Edition 2015, Laxmi Publications Pvt. Ltd.

Sr. No.	Author	Title	Publisher and Edition
01	Dadhe, Jamdar and Walawalkar	Fundamentals of Applied Mechanics	Second edition 2006, Publisher-Sarita Prakashan.
02	www.nptel.ac.in		

Curriculum Coordinator　　　　　Head of the Department　　　　　Dean Diploma

BOS VJTI Approval dated 5/3/2024

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: ENGINEERING GRAPHICS - II
COURSE CODE	: 234ME24

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	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
2	-	4	-	3	3	30	70	28	100	40	25	10	-	-	-	-	125

II. RATIONALE

The student will be able to

1. Understand the fundamentals of Engineering Graphics
2. Read and interpret object drawings.

III. COURSE OUTCOMES

Student should be able to

CO1	To understand geometry of shapes, drawing conventions, definitions and drawing procedures.
CO2	To imagine shapes of solid objects in three dimensions and draw their different views.
CO3	To imagine internal details of solid objects from given views and use of drawing conventions.

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION-I							
Unit &Sub-Unit	Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1	**Sections of Solids**	6	14	1,2	40	30	30
	Sections of solids by different auxiliary (Straight) cutting planes perpendicular to one reference plane, True shape of section. (Solids with axis perpendicular to one						

Unit &Sub-Unit	Topics/Sub-topics						
	reference plane) (No problems with given true shape of section)						
2	**Development of lateral surfaces of cut solids** Development of lateral surfaces of solids cut with straight cutting plane only (No problems on reverse development).	4	7	1,2	40	30	30
3	**Sectional orthographic** Sectional orthographic projection of simple machine parts. (Full section in one view)	8	14	2,3	40	30	30
SECTION-II							
Unit &Sub -Unit	Topics/Sub-topics						
4	**Pictorial Views** Isometric Views. (No problems with circular slots on inclined surfaces)	7	14	1,2	40	30	30
5	**Reading of Simple Orthographic Projections** Missing Views including Sectional Views of simple machine parts (Full Section in one view)	7	21	2,3	40	30	30

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

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/ASSIGNBMENTS/TUTORIALS

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1.	1	Six sheets on problems on sections of solids (18 to 20 Problems)	14	1,2,3
	2	Four sheets on problems on development of surfaces. (8 to 12 Problems)	8	1,2,3
	3	Six sheets on sectional orthographic projection. (12 to 20 Problems)	14	1,2,3
	4	Six sheets on isometric views. (20 to 20 Problems)	14	1,2,3
	5	Six sheets on problems from reading orthographic projections. (10 to 12 Problems)	14	1,2,3

VI. ASSESMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)
- Midterm Test Exam
- Term Work

Summative Assessment (Assessment of Learning)
- End Term Exam

VII. SUGGESTED COS-POS AND COS-PSOS 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	1	-	2	1	-	-	1	1	1
CO2	1	-	2	1	-	-	1	1	1
CO3	1	-	2	1	-	-	1	1	1

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

VIII. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFRENCE BOOKS/WEBSITES

Sr. No.	Author	Title	Publisher and Edition
1	N.D.Bhatt	Engineering Drawing	Charotar Publishers 53rd Edition 2014
2	S.T.Ghan, M.V.Rawalani	Engineering Drawing	Nirali PublicationsEdition -2014/1
3	D.A.Jolhe	Engineering Drawing	TATA McGraw Hill- 2008

Curriculum Coordinator   Head of the Department   Dean Diploma

BOS VJTI Approval Dt. 5/3/2024

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING
COURSE CODE	: 234EE25

I. TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
						FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
CL	TL	LL	Self-learning	CR	PAPER HRS						FA-PR (CA)		SA-PR		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
4	–	2	2	4	3	30	70	28	100	40	25	10	@25	10	25	10	175

II. RATIONALE

The student will be able to

1. Understand the concept and principle of A.C. fundamental. (ii) Select the drive for a given application. (iii) Understand basic principles of DC machines and AC machines and little bit knowledge of drives

2. Can draw and describe basic electronic circuit.

III. COURSE OUTCOMES (COS)

Student should be able to

CO1　To understand the basic principles of ac and dc fundamentals.

CO2　To understand the working of different electrical machines and their applications.

CO3　To understand the working of electronic components & their applications.

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION - I								
Unit &Sub-Unit		Topics/Sub-topics	Hrs.	Marks	CO	R Level	U Level	A Level
1	1.1	**Electricity Fundamentals:** Voltage, Current, Power and their relation between V, I and P	06	08	1	40%	40%	20%
	1.2	Resistance, Ohm's Law Effect of temperature on resistance.						
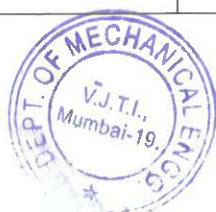
			Hrs.	Marks	CO	R Level	U Level	A Level
	1.3	Series Circuit, Parallel Circuit						
	1.4	Kirchhoff laws.						
	1.5	Mesh analysis and Node analysis of simple electric circuits. (Problems having 2 equations only).						
	1.6	Concept of Inductor & Capacitor elements.						
	1.7	Faraday's law of Electromagnetic Induction						
2	2.1	**A.C Fundamental** Definition of Alternating Current and Voltage Terms related with alternating quantity	03	08	2	60%	20%	20%
	2.2	R.M.S value, average value						
	2.3	Phasor representation of ac quantities						
	2.4	Polar to rectangular and rectangular to polar conversion.						
3	3.1	**3-Phase Circuits** **Concept of 3-phase circuit**	03	06	2	20%	40%	40%
	3.2	Balanced star and delta connection. Their voltage current and power relationships.						
4	4.1	**Electrical Machines** Construction and principle of operation of single-phase transformer. EMF equation of transformer (without derivation)	14	18	3	20%	40%	40%
	4.2	Construction and principle of operation of DC machine. EMF equation of a DC machine (without derivation).						
	4.4	**Types of AC Motors** – construction of Single phase Induction motor &three phase Induction motor, their working principle, and applications.						

SECTION – II								
Unit & Sub-Unit		Topics/Sub-topics	Hrs.	Marks	CO	R Level	U Level	A Level
5	5.1	**Diodes:** Review of Intrinsic & Extrinsic Semiconductor materials. P type & N type Semiconductor materials.	8	18	4	20%	60%	20%

		Construction of Germanium & Silicon PN junction diodes. Forward and Reverse current/voltage characteristics of diode. Temperature effect on diode.						
	5.2	**Application of diode in Half wave & Full wave rectifier** (Center Tap Transformer & Bridge type) circuits. Formula for average load voltage & current (no derivation)						
	5.3	Capacitor C and Inductor L Filter circuits						
	5.4	Zener diode operation and voltage/current characteristics. Application of Zener diode in a simple voltage regulator circuit						
	5.5	Light Emitting Diodes (LED) working, forward Characteristics & applications. Seven segment display application						
6	6.1	**Bipolar Junction Transistor:** Construction of PNP & NPN type of BJT.	8	10	4	20%	60%	20%
	6.2	Common Base, Emitter & Collector configurations						
	6.3	Input and output characteristics of CE configuration.						
	6.4	Common Emitter small signal voltage amplifier application.						
	6.5	Common Emitter switch application						
7	7.1	**Silicon Controlled Rectifier:** Construction of Silicon Controlled Rectifier, its operation & characteristics	02	08	4	20%	60%	20%
8	8.1	**Digital Electronics** Study of logic gates (AND, OR, NOT, NOR, NAND) Symbols and truth table.	02	04	4	40%	40%	20%
	8.2	Study of flip-flops: J-K Flip flop.						

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

V. LIST OF PRACTICALS/ASSIGNBMENTS/TUTORIALS

Sr. No.	Practicals	Approx. Hours	CO
1	To verify Kirchhoff's Voltage Law.	2	1
2	To verify Kirchhoff's Current Law.	2	1
3	To observe and study construction details of Transformer.	2	2
4	To observe and study construction details of DC Motors.	2	2
5	To observe and study construction details of Induction Motors.	2	2
6	To plot forward and reverse voltage/current characteristics of Germanium and Silicon diode.	2	3
7	To measure average load voltage and current for half wave and full wave rectifier circuits.	2	3
8	To plot forward V/I characteristics of Red, Green, Yellow & Blue LED's	2	3
9	To plot reverse characteristics of Zener Diode.	2	3
10	Study of single phae half wave phase controlled rectifier.	2	3
11	Use of Common Emitter Bipolar Junction Transistor as a switch	2	3
12	Use of common Emitter Bipolar Junction Transistor in voltage amplifier.	2	3
* Minimum 8 and maximum 12 practical/experiment sessions to be included in a course in a term			

VI. SUGGESTED SELF LEAR. ASSIGNMENTS/MICROPROJECT/ACTIVITIES

Assignments (if any)

- Numericals on Series and parallel circuits.
- Numericals on Node and mesh analysis.
- Construction of Dc motor
- Classify DC motor and draw characteristics of dc motors
- Draw V/I characteristics of Diode and Zener diode
- Draw input and output characteristics of CE configuration
- Construction of Silicon Controlled Rectifier, its operation & characteristics
- Draw symbol and truth table of logic gates

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 AND COS-PSOS 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	2	1	-	1	-	-	-	1	1
CO2	2	1	-	1	-	-	-	2	2
CO3	2	1	-	1	-	-	1	1	1

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

IX. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFRENCE BOOKS/WEBSITES

Sr. No.	Author	Title	Publisher and Edition
1	B.L.Thereja	Fundamentals of Electrical Engineering and Electronics	S Chand Publications
2	J.B.Gupta	Basic Electrical & Electronics Engineering	S. K. Kataria&Sons Publications

Sr. No.	Author	Title	Publisher and Edition
1	V.K.Mehta	Principles of Power System	S Chand Publications
2	V. Kamraju	Electrical Power Distribution System	Mc.GrawHill
3	S.Sivanagaraju S.Satyanarayana	Electrical Power Transmission and Distribution	Pearson
4	Soni,Gupta, Bhatnagar	A Course in Electrical Power	Dhanpat Rai
5	S.L.Uppal	A Course in Electrical Power	S.K.Khanna
6	J.B.Gupta	Transmission and Distribution of Electrical Energy	S.K.Khanna

Curriculum Coordinator   Head of the Department   Dean Diploma

BOS VJTI Approval Dt. 05/03/20

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: MECHANICAL WORKSHOP PRACTICES II
COURSE CODE	: 234ME26

I. TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
						FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
CL	TL	LL	Self-learning	CR	PAPER HRS						FA-PR (CA)		SA-OR		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
1	-	3	-	2	-	-	-	-	-	-	25	10	@ 25	10	-	-	50

II. RATIONALE

To lay a strong foundation in study and practice of basic workshop processes.

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

III. COURSE OUTCOMES (COs)

Student should be able to

- CO1 - Adopt safety practices while working on various machines.
- CO2 - Operate, control different machines and equipments.
- CO3 - Inspect and produce the job as per specified dimensions.

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Welding Shop**	4	-	1,2,3	40%	40%	20%
	1.2	Introduction.						
	2.2	Types of welding, ARC welding, Gas welding, Gas Cutting.						
	2.3	Welding of dissimilar materials, Selection of welding rod material, Size						

			Hours	Marks	CO	R Level	U Level	A Level
		of welding rod and work piece.						
	3.3	Different types of flame.						
	3.4	Elementary symbolic representation.						
	3.5	Safety precautions in welding, safety equipments and its use in welding processes.						
2		**Lathe**	8	-	1,2,3	40%	40%	20%
	2.1	Introduction.						
	2.2	Main parts of Lathe machine.						
	2.3	Study and sketch of lathe machine						
	2.3	Various machine operations performed on Lathe machine						
3		**Machines**	4	-	1,2,3	40%	40%	20%
	3.1	Study and Sketch of grinders, milling machine, drilling machine and CNC machine.						

Legends: R- Remember, U – Understand, A – Apply

V. LIST OF PRACTICALS/ASSIGNBMENTS/TUTORIALS

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Metal Turning**	12	-	1,2,3	40%	40%	20%
	1.1	Demonstration of Lathe machine.						
	1.2	Demonstration of various parts of Lathe machine.						
	1.3	Two simple job involving plain turning						
2		**Wood Turning**	12	-	1,2,3	40%	40%	20%

	2.1	Demonstration of different wood working processes, like plaining, marking, chiseling, grooving, turning of wood etc.						
	2.2	One simple job involving turning, step turning, ball turning operation on wood.						
4		**Welding Shop**	12	-	1,2, 3	40%	40%	20%
	4.1	Demonstration of different welding tools / machines. Demonstration of Arc Welding, Gas Welding, Gas Cutting and rebuilding of broken parts with welding. One simple job involving butt and lap joint.						

Legends: R- Remember, U – Understand, A – Apply

VI. ASSESMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)
- Term Work

Summative Assessment (Assessment of Learning)
- End Term Assessment of job prepared by students.

VII. SUGGESTED COS-POS AND COS-PSOS 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	2	1	-	-	-	1	1	1	1
CO2	2	1	-	-	-	1	1	2	2
CO3	2	1	-	-	-	1	1	1	1

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

IX. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFRENCE BOOKS/WEBSITES

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, 9 th Edition, 2002
3	S.K. Hajra Chaudhary	Workshop Technology Vol I & II	Media Promotors and Publisher, New Delhi. 8 th edition , 1986

Curriculum Coordinator   Head of the Department   Dean Diploma

BOS VJTI Approval Dt. 05/03/2024

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: COMPUTER AIDED DRAFTING
COURSE CODE	: 234ME27

I. TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
						FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
CL	TL	LL	Self - learnin g	CR	PAPER HRS						FA-PR (CA)		SA-PR		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
1	-	2	-	1.5	-	-	-	-	-	-	25	10	@ 25	10	-	-	50

II. RATIONALE

The student of Mechanical Engineering discipline should be able to read and interpret drawings of machine components and assemblies in different views, with different sections using usual drawing conventions. This course offers inputs about use of computers for the drafting of machine drawings and component drawings.

The students are trained in using various commands and other computer related procedures like printing, scanning etc such that they will be conversant with Computer aided drafting techniques. These techniques will be further used in higher semesters for preparation of machine drawings as specified in curriculum.

III. COURSE OUTCOMES (COS)

Student should be able to

CO1	Use different commands to draw geometrical objects using computer aided techniques
CO2	Modify existing drawings to introduce changes as and when needed for betterment of performance
CO3	Incorporate additional information in the drawing like dimensions, machining symbols, text, material conventions etc by forming library of symbols
CO4	Use accessories like printers, scanners etc for making physical use of drawings as needed in engineering processes.

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1	1.1	**SCREEN INFORMATION:** Title Bar, Pull-Down Menu Bar, Standard Tool Bar, Optional Tool Bars, Drawing Area, Crosshair , Cursor / Pointer / Pick box, WCSICON,UCSICON ,Command . Line, Status Line, GRID, SNAP, ORTHO, OSNAP etc.	1	2	1	0	0	100
	1.2	**BASIC DRAW COMMANDS:** LINE, UNDO, ERASE, PAN,ZOOM, GRID,SNAP,ORTHO, FUNCTION KEYS, ESCAPE, BACK SPACE, DELETE, SAVE Etc. SETTING OF THE SCREEN RESOLUTION	1	3	1	30	0	70
2	2.1	**ADVANCED DRAW MENU:** CONSTRUCTION LINE, MULTILINE: POLYGON, RECTANGLE, ARC, CIRCLE, DONUT, ELLIPSE, POINT	3	3	1	0	50	50
	2.2	**To draw with DIMENSIONS** Use of Coordinates systems like, Rectangular Coordinate System, Polar Coordinate System, WCSICON & UCSICON Representation of coordinate axes x and y and origin point; for the drawing area. Setting of DRAWING LIMITS, UNITS, Precision levels; METHODS OF 'SELECT OBJECT'OSNAP , GRID, COLOR ETC Getting information about a drawing: 1.Distance, Area, List, ID point,T ime, Calculator etc	2	3	1	0	50	50
	2.3	**CONTENTS OF MENU: MODIFY** ERASE, COPY, MIRROR, OFFSET, ARRAY, MOVE, ROTATE, SCALE, STRETCH, TRIM, EXTEND, BREAK, CHAMFER, FILLET, EXPLODE:	2	3	2	0	50	50

		MODIFY PROPERTIES: Several properties of an entity can be modified as follows: Color, Linetype, Lineweight, Layer, Dimension, Text matter, Angle , Scale etc						
	2.4	To draw different types of lines using LINETYPE, LTSCALE GRIPS: This is a 'shortcut' facility for applying certain commands. HATCH, TEXT It is a writing facility provided for putting TEXT matter in a drawing. Command: Dtext – Dynamic test. TEXT MODIFICATION: Select a text→modify/properties.	2	2	2	50	0	50
3	3.1	**DIMENSIONING** Various types of dimensions are automatically put in the drawing including dimension line, extension line, dimension text and arrows. These features are preset but can be changed. Linear, Aligned, Ordinate, Angular. Baseline, Continue, Leader, Center mark, Align text.	2	3	3	0	50	50
	3.2	**DIMENSION SETTINGS** The various parameters of dimensions can be set as per customer needs. Such a new style can be stored and recalled when required. Style, Modify, Text, Fit, Units, Tolerances: Formats of tolerances like limits, deviation,	2	3	3	0	50	50
4	4.1	**PRINT: (File)** Options in dialogue box: Plot device, Plot settings, Drawing orientation, Plot scale, Window, Plot preview, OK: By pressing ok; the printer starts printing action.	1	3	4	0	50	50

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

V. LIST OF PRACTICALS/ASSIGNBMENTS/TUTORIALS

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1	1.1, 1.2	Use of screen information and setting of screen	2	1
2	1.2	To draw simple objects using basic commands and applying screen settings	6	1
3	2.1, 2.2	To draw geometrical figures with dimensions	10	2
4	2.3, 2.4	Modifications in existing drawings and introduction of text	6	2
5	3.1, 3.2	Introducing dimensions in drawings as per different commands and settings	6	3
6	4.1	Printing of drawings – understanding related commands and settings required	2	4

VI. ASSESMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)
- Term Work

Summative Assessment (Assessment of Learning)
- Practical Examination

VII. SUGGESTED COS-POS AND COS-PSOS 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	2	1	1	1	0	0	2	1	1
CO2	1	2	2	1	0	0	1	1	2
CO3	2	1	1	2	0	1	3	1	1
CO4	2	2	2	3	1	1	2	1	1

Legends :- High:03, Medium:02,Low:01, No Mapping: -
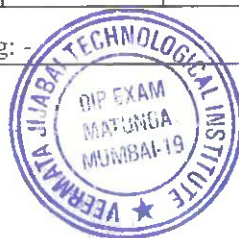
VIII. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFRENCE BOOKS/WEBSITES

Sr. No.	Author	Title	Publisher and Edition
1	Ackraman	Introduction to AutoCAD vol I	NA
2	Ackraman	Introduction to AutoCAD vol II	NA
3	AUTODESK	AUTOCD Handbook	NA

Curriculum Coordinator   Head of the Department   Dean Diploma

BOS VJTI Approval Dt. 05/03/2024

DIPLOMA PROGRAMME	:DIPLOMA IN CHEMICAL/ CIVIL/ ELECTRICAL/ ELECTRONICS/ MECHANICAL/ TEXTILE ENGINEERING
PROGRAMME CODE	: DCHE/ DCE/ DCE/ DELNE/ DME/ DTE
SEMESTER	: SECOND
COURSE TITLE	: SOCIAL AND LIFE SKILLS
COURSE CODE	: 235CH28/ 231CE29/ 232EE28/ 233EX28/ 234ME28/ 236TE28

I. TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
						FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on Self-learning				Based on Self-learning		
CL	TL	LL	Self-learning	CR	PAPER HRS						FA-PR (CA)		SA-PR (PR/OR)		SLA		TOTAL MARKS
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
-	-	-	2	1	-	-	-	-	-	-	50	20	-	-	-	-	50

II. RATIONALE

Life skills can be defined as abilities that enable humans to deal effectively with the demands and challenges of life. Social skills that are needed for successful, healthy relationships to easily adapt when moving from one social situation to the next. They have effectively and develop enduring, supportive relationships, we're happier and healthier. This is why developing life skills and eventually being successful in life, it's key for our health and well-being. Thus, Teaching of Social and life skills provides students with essentials of 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 option.

MODULE-I : Unnat Maharashtra Abhiyan (UMA)

MODULE-II : National Service Scheme (NSS)

MODULE-III : Universal Human Values

MODULE-IV: Value Education (Unnati Foundation)

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 by the institute. Different groups of students may be offered different MODULE based on their choices.

III. COURSE OUTCOMES (COs)

Students will be able to achieve 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.

- CO3 - Provide the opportunity to self realize one's potential through practical experience while working individually or in a group.

- CO4 - Develop interpersonal skills and adopt good leadership behavior for self empowerment and empowerment of others around us.

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

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION - I			
Unit & Sub-Unit	Topics/Subtopics	Suggested Learning Pedagogies.	Hours
1	**MODULE I : 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 etc 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 1.9 Fieldwork :	i) Group discussion ii) Role play iii) Case study iv) Seminar and presentation **Suggested Implementation guidelines:** 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 2. Survey Visit 1 - Data gathering / Information Collection 3. Survey Visit 2 - Data gathering 4. Summary Visit - Closure after	32
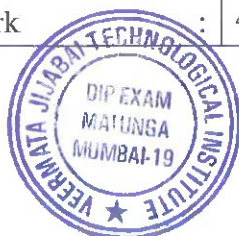
Measurement and quantifications of local systems such as agriculture produce, rainfall, Road network, production in local industries, Produce /service which moves from A to B
1.10 Analysis and Report writing
Report writing containing-
1. Introduction of the topic
2. Data collected in various formats such as table, pie chart, bar graph etc
3. Observations of field visits and data collected.

analysis

Methodology:
Considering the nature of the course designed, following points shall be considered while implementing the course.
i) Regroup in the batches of 5-6 students for conducting the fieldwork from the bigger group.
ii) Assign a few batches of the students for this course to all the faculty members.
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.
iv) The group of course teachers will carry out initial field visits to evaluate the various possibilities of field visits / various scenarios where students can conduct field work to measure / quantify the parameters / attributes.

Implementation and Evaluation parameters:
Explain developmental needs and connection of various stakeholders.

Enlist the local problems.

Design a methodology for fieldwork.

Select the attributes of engineering and social systems for measurement, quantification, and documentation.

Measure & quantify the quantities / systems parameters.

Write a report using information collected tStudy the data collected from fieldwork and conclude the observations.

2	**MODULE II : 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. 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 Problem(s) 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.	**Suggested Implementation guidelines:** (i) The teachers should visit the village / slum before adopting it for NSS activities. (ii) The selected area should be compact. (iii) The community people should be receptive to the ideas of improving their living standard. They should also be ready to coordinate and involve in the projects undertaken by the NSS for their upliftment. (iv) The areas where political conflicts are likely to arise should be avoided by the NSS units. (v) The area should be easily accessible to the NSS volunteers to undertake frequent visits to slums. **Implementation and Evaluation parameters:** Adopt a Village or Slum for providing needed services to the community. Carry out surveys to identify the problems of the village community. Undertake Special camping about developmental programs. Establish the liaisons between government and other developmental agencies for the implementations of various development schemes of Government.	32
3	**MODULE-III : Universal Human Values**		
	3.1 Love and Compassion (Prem and Karuna): Introduction, Practicing Love and Compassion (Prem and Karuna) 3.2 Truth (Satya) : Introduction,	**Suggested Implementation guidelines:** i) Lectures ii) Demonstration	

	Practicing Truth (Satya) 3.3 Non-Violence (Ahimsa) : Introduction, Practicing Non-Violence (Ahimsa) 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	iii) Case Study iv) Role Play v) Observations vi) Portfolio Writing vii) Simulation viii) Motivational talks by Practitioners ix) Site/Industry Visit **Implementation and Evaluation parameters:** Demonstrate Love and Compassion (Prem and Karuna) in the society. Follow the path of Truth (Satya). Practice Non-Violence (Ahimsa). Follow the Righteousness (Dharma). Attain Peace (Shanti) in Life. Provide Service (Seva) to the needy person/community. Demonstrate Renunciation (Sacrifice) Tyaga. Practice Gender Equality and Sensitivity.	32
4	**MODULE-IV: 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, 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 4.3 Responsibility, OCSEM- Visual Comprehension and Word Based Learning, Goal Setting – Make it happen, Follow, Like & Share Unnati Social	**Suggested Implementation guidelines:** i) Video Demonstrations ii) Flipped Classroom iii) Case Study iv) Role Play v) Collaborative learning vi) Cooperative Learning vii) Chalk-Board **Implementation and Evaluation**	

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 , b. 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 upskilling 4.8 Caring and Sharing , Handling Customer queries, Flexibility & Adaptibility, Student referral process, Writing a Resume, OCSEM-Public Speaking, Placement Process, Meditation/ Affirmation & OCSEM-Debate, Introduce Certif-ID, how to create Certif-ID Project , 4.9 Honesty, Email etiquette & Official Email communication, Alcohol & Substance use & abuse, Describing a known place , Leadership Skills,	**parameters:** Demonstrate Punctuality appropriately. Practice Cleanliness, Hygiene and Orderliness for self and others. Take Responsibility and Calculated Risks. Demonstrate Gratitude and Appreciations. Show Determination & Persistence about work. Give Respect as per the social norms and practice. Respect Team Spirit to the acceptable level. Practice Caring & Sharing among fellow citizens/community. Demonstrate Honesty. Practice for Forgive and Forget.	32

	Describing an event, OSCEM-Picture Reading & Visual Comprehension 4.10 Forgive and Forget, Facing and Interview, OSCEM-Public Speaking , Attending a telephonic/Video interview & Mock Interview , Affirmation , Pat-a-Back & Closure (Valediction , Unnati Branding, Student Testimonials), Meditation/ Affirmation & Sponsor connect (Speak to UNXT HO)		
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 5.3 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 Donts in Financial planning and Transactions	**Suggested Implementation guidelines:** i) Online/Offline Mode of Instructions ii) Video Demonstrations iii) Presentations iv) Case Study v) Chalk-Board vi) Collaborative learning **Implementation and Evaluation parameters:** Develop Literacy About Savings and Investments in the community. Attain Literacy About Financial Planning. Demonstrate skills about Financial Transactions. Use Literacy skills About Income, expenditure and budgeting. Use measures about Inflation in the market. Use Literacy/Knowledge About Loans. Explain the Importance of Insurance. Follow Dos and Don'ts about finances.	32

V. LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS

Practical/Assignments/Tutorials may be designed by the faculty and allotted to the students depending on the selected module.

VI. ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)
- Report and presentation of fieldwork activities.

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	-	-	-	-	03	03	03	-	03
CO2	-	-	-	-	02	02	03	-	03
CO3	01	01	01	-	03	03	03	-	03
CO4	-	01	01	01	03	03	03	-	03
CO5	-	02	-	01	03	03	03	-	03

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

VIII. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

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 Engineering Colleges on 'IMPROVING THE PERFORMANCE OF RURAL WATER SUPPLY AND SANITATION SECTOR 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	Indian Standards (IS) Codes and Indian Roads	Bureau of Indian

	And Standards Committee	Congress (IRC) Codes	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
6	RBI	https://www.rbi.org.in/FinancialEducation/content/GUIDE310113_F.pdf	RBI
7	RBI	https://www.rbi.org.in/FinancialEducation/content/Financing%20needs%20of%20Micro%20and%20small%20Enterprises%20-%20A%20guide.pdf	RBI
8	RBI	https://www.rbi.org.in/FinancialEducation/content/I%20Can%20Do_RBI.pdf	RBI

IX . LEARNING WEBSITES & PORTALS

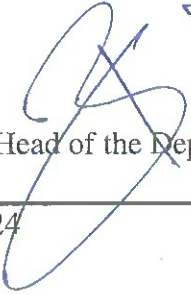| Sr.No	Link / Portal	Description
1	https://gr.maharashtra.gov.in/Site/Upload/Government%20Resolutions/English/201601131501523808.pdf	Government Resolution of Government of Maharashtra regarding Unnat Maharashtra Abhiyan
2	https://gr.maharashtra.gov.in/Site/Upload/Government%20Resolutions/English/201606151454073708.pdf	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 Pollution Control 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. Milind Sohoni, 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_	UHV: UGC Course on life skils. Unit 4 i.e.

		LifeSKill_JeevanKaushal_2023.pdf	Course 4 is to be referred
14		https://nss.gov.in/	NSS : Know about the NSS Scheme and details
15		https://www.rbi.org.in/FinancialEducation/FinancialEnterprenure.aspx	Reference for Module V
16		https://www.rbi.org.in/FinancialEducation/content/I%20Can%20Do_RBI.pdf	Reference for Module V
17		https://www.rbi.org.in/FinancialEducation/content/Financing%20needs%20of%20Micro%20and%20small%20Enterprises%20-%20A%20guide.pdf	Reference for Module V
18		https://www.rbi.org.in/FinancialEducation/content/GUIDE310113_F.pdf	Reference for Module V

Note :

Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students.

Curriculum Coordinator   Head of the Department   Dean Diploma

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