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Programme: Diploma in Mechanical Engineering (DME) **Semester : II** **Implemented from: 2017**

COURSE CODE	COURSE	GR	TEACHING SCHEME (HRS/WK)				EXAMINATION SCHEME												
			L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
								Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
174MA21b	Mathematics-II	B	3	2	0	5	3	80	32	20	100	40	-	-	-	-	25	10	**125**
174PH22	Physics-II	B	2	0	2	4	3	80	32	20	100	40	25	10	-	-	25	10	**150**
174CH23	Chemistry-II	B	2	0	2	4	3	80	32	20	100	40	25	10	-	-	25	10	**150**
174HM24	Tech. Comm.& presentation Skills	A	0	2	0	2	-	-	-	-	-	-	-	-	25	10	25	10	**50**
174SE25	Engineering Mechanics	C	4	0	2	6	3	80	32	20	100	40	-	-	-	-	25	10	**125**
174ME26	Engineering Drawing- II	C	2	0	4	6	3	80	32	20	100	40	-	-	-	-	50	20	**150**
174ME27	Basic Workshop Practice-II	C	0	0	3	3	-	-	-	-	-	-	-	-	-	-	50	20	**50**
174ME28	Comp Aided Drafting	A	1	0	2	3	-	-	-	-	-	-	25	10	-	-	25	10	**50**
	TOTAL		**14**	**4**	**15**	**33**	-	**400**	-	**100**	**500**	-	**75**	-	**25**	-	**250**	-	**850**

Abbreviations: B – Basic; C – Core; A – Applied; M – Management; L – Theory Lecture; T – Tutorial; P – Practical; TH – Theory Paper; IST – In-Semester Test; PR – Practical Exam; OR – Oral Exam; TW- Term Work; GR – Grade; CR - Credits

Curriculum Coordinator

Head
Diploma in Mechanical Engineering

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE ★ MATUNGA MUMBAI-19

Dean - Diploma

Syllabus (R-2017)

COURSE : DME **SEMESTER : II**

SR. NO	SUBJECT TITLE	SUBJECT CODE
1	Mathematics- II	174MA21b
2	Physics- II	174PH22
3	Chemistry-II	174CH23
4	Tech. Comm.& present Skills	174HM24
5	Engineering Mechanics	174SE25
6	Engineering Drawing- II	174ME26
7	Basic Workshop Practice II	174ME27
8	Computer Aided Drafting	174ME28

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: MATHEMATICS II
COURSE CODE	: 174MA21b

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	2	-	5	3	80	32	20	100	40	-	-	-	-	25	10	125

Course Objectives:

1. To lay a strong foundation in study of calculus which is the backbone for study in Engineering.

2. To make students well versed in the prerequisites for further studies in Mathematics and Engineering.

Course Outcomes:

Student should be able to

CO1	Apply elementary operations and properties of vectors in engineering problems.
CO2	Use definition and formulae of function, limit, derivative and partial derivatives to solve the problems.
CO3	Use derivatives in applications.

Course Content:

SECTION-I							
Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level

1		**Function**	5	10	2	40%	40%	20%
	1.1	Definition of function.						
	1.2	Types of Functions: Polynomial, constant, explicit function, implicit function, periodic function, even and odd functions, inverse function, exponential function, logarithmic function, composite function						
	1.3	Simple problems based on function.						
2		**Limit**	10	12	2	40%	40%	20%
	2.1	Concept of limit of a function.						
	2.2	Theorems on limits (Without proof)						
	2.3	Limits of algebraic, trigonometric functions.						
	2.4	Standard limits						
3		**Derivatives**	11	18	2	40%	40%	20%
	3.1	Derivatives of standard functions by first principle.						
	3.2	Rules of differentiation.						
	3.3	Derivative of composite function. (chain rule).						
	3.4	Derivative of implicit function, parametric function.						
	3.5	Logarithmic differentiation.						
SECTION-II								
Unit & Sub-Unit		**Topics/Sub-topics**						
4		**Second ordered derivative.**	2	6	2	40%	40%	20%
5		**Applications of derivatives**	10	16	3	30%	30%	40%

	5.1	Equation of tangent and normal to the given curve.						
	5.2	Maxima and minima of function.						
	5.3	Rate problems						
6		Partial derivatives of first order of functions of two variables.	2	6	2	40%	40%	20%
7		**Vector Algebra**	8	12	1	40%	40%	20%
	7.1	Definition of vector, types of vector, vector addition, subtraction, multiplication by scalar.						
	7.2	Dot product, cross product and their properties.						

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

List of Practicals/Assignments/Tutorials:

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1	7	Vector	2	1
2	1	Function	2	2
3	2	Limits of algebraic functions.	2	2
4	2	Limits of trigonometric functions.	2	2
5	3	Derivative of composite function.	2	2
6	3	Derivative of implicit and parametric function.	2	2
7	4	Second ordered derivative. Equation of tangent	2	3
8	5	Maxima and minima of function. Rate problems	2	3
9	6	Partial derivatives	2	2

Reference books :

Sr. No.	Author	Title	Publisher and Edition
1	S. P. Deshpande	Mathematics for Polytechnic	Pune Vidyarthi Griha Prakashan,
2	H.K.Dass	Advanced Engineering Mathematics	S.Chand & Company Ltd. Delhi
3	Dr.B.S.Grewal	Higher Engineering Mathematics	Khanna Publishers Delhi

Curriculum Coordinator **Head Diploma in Mech Engg** **Dean - Diploma**

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE MATUNGA MUMBAI-19

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: II
COURSE TITLE	: Physics – II
COURSE CODE	: 174PH22

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR*		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
2	-	2	4	3	80	32	20	100	40	25	10	-	-	25	10	150

*Practical examination will be conducted by internal faculty.

Rationale:–

Physics is the 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 and environmental and so on depends upon the development of physics and its detail understanding.

Objectives:

Students should be able to;

Understand basics of crystal structures and types of simple cubic structures.

identify the phenomena of interference, diffraction and polarization of light, properties and applications of sound, concepts used in modern physics and its industrial applications.

analyze and use it for solving engineering problems.

identify, analyze, discriminate and interpret logical sequence of field problems with the study of physics.

Course Outcomes:

Student should be able to

CO1	Understand simple cubic structure and Miller indices.
CO2	Understand concepts used in various phenomena of optics, such as wave theory, interference, diffraction, polarization etc., along with their applications and problems based on it.
CO3	Understand longitudinal waves, their velocity, factors affecting velocity of sound, concept of resonance, laws of vibrating string, sonometer and resonance tube.
CO4	Understand concepts of modern physics used in X-rays and photoelectric effect, with their applications and problems based on it.

Course Content:

SECTION-I

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1.	**Crystal structure**		6	16	1	40%	40%	20%
	1.1	Unit cell, Bravais lattice, basis, cubic structures, SC, BCC and FCC, lattice parameter and atomic radius in all three cases, number of lattice points per unit cell, co-ordination number, packing efficiency.						
	1.2	Miller directions, Miller indices, determination of miller indices from intercepts of plane, identification of Miller indices of a given plane, distance between planes						
2.	**Optics**		10	24	2	40%	40%	20%
	2.1	Wave theory – wavefront, wave normal, laws of reflection and refraction, problems, Huygen's principle, dispersion, total internal reflection.						
	2.2	Interference – principle of superposition, constructive and destructive interference, conditions to obtain interference pattern,						

		Young's double slit experiment, derivation of bandwidth, problems.						
	2.3	Diffraction – definition, types of diffraction, single slit diffraction pattern, diffraction grating, grating element, grating formula, problems, determination of wavelength of light.						
	2.4	Polarization – polarized and unpolarized light, polarizer, analyzer, optical activity, optical rotation, specific rotation, polarimeter (principle, construction, working and applications)						
SECTION-II								
Unit & Sub-Unit		**Topics/Sub-topics**						
3	**Sound**							
		Transverse and longitudinal waves, velocity of sound, Newton's formula and Laplace's correction, effect of various factors on velocity of sound, stationary waves, transverse vibrations on string, laws of vibrating string, resonance, sonometer, resonance tube closed at one end, determination of velocity of sound using	10	24	3	40%	40%	20%
4	**Modern physics**							
	4.1	X-rays – Coolidge X-ray tube, continuous characteristic and X-rays, problems, properties and applications, Moseley's law.						
	4.2	Photoelectric effect – Planck's theory of radiation, Einstein's photoelectric equation, problems, photocells – photo-emissive, photovoltaic and photoconductive (construction, working and applications)	6	16	4	40%	40%	20%
	4.3	LASER – spontaneous and stimulated emission, absorption, excitation, metastable states, population inversion, optical pumping, lasing action, working of laser, He-Ne laser, properties						

		and applications of lasers.						
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.*

List of Practicals

Sr. No.	Practicals	Approx. Hours	CO
1	Study of simple cubic crystal structures.	2	1
2	Study of Miller planes	2	1
3	Determination of refractive index of glass using Snell's law.	2	2
4	Determination of wavelength of LASER.	2	2
5	Determination of grating element.	2	2
6	Determination of specific rotation of given liquid.	2	2
7	Verification of first law of vibrating string.	2	3
8	Verification of second law of vibrating string.	2	3
9	Determination of velocity of sound using resonance tube.	2	3
10	Calculation of densities of different crystal structures.	2	1
* Minimum 8 practicals/experiment sessions to be included in a course in a term			

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	XIth standard physics book		HSC Board, M.S. / NCERT
2	XIIth standard physics book		HSC Board, M.S. / NCERT

Reference books and Websites:

Sr. No	Author	Title	Publisher and Edition
1	Halliday D., Resnik R. and Walker	Fundamentals of physics extended	Wiley India, New Delhi, 8th edition
2	Serway R A and Jewett, Jr. J W	Physics for scientists and Engineers	Cengage learning, New Delhi, 6th edition
3	Verma H C	Concepts of Physics – Part I and II	Bharti Bhavan, New Delhi

Curriculum Coordinator **Head Diploma in Mech Engg** **Dean - Diploma**

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE ★ MATUNGA MUMBAI-19

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: CHEMISTRY – II
COURSE CODE	: 171CH23

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME											
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
2	-	2	4	3	80	32	20	100	40	25	10	-	-	25	10	150

Course Objectives:

1. To understand mole concept and volumetric analysis.
2. To represent the formation of bonds in molecules.
3. To describe the mechanism of redox reactions.
4. To identify the properties of organic compounds related to engineering applications.

Course Outcomes:

Student should be able to

CO1	Describe the method for removing hardness from water.
CO2	Select appropriate materials used in lubrication.
CO3	Identify the properties of metals and alloys related to engineering applications
CO4	Apply knowledge to enhance operative life span of engineering material & structure by various corrosion protective methods.
CO5	Know properties and applications of different types of fuels.
CO6	Recognize the idea behind the Superconductivity phenomenon and be aware of its

	applications.
CO7	Perform laboratory experiment demonstrating safe and proper use of standard chemistry glass ware and equipments
CO8	Record and interpret the data obtained from experimentation

Course Content:

SECTION-I								
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Water**						
	1.1	Introduction, Hard and soft water, hardness, types of hardness, its expression as calcium carbonate hardness, its units and its determination (EDTA method only).	7	20	1	40%	40%	20%
	1.2	Disadvantage of use of hard water, Water softening External processes – Lime – Soda process, Zeolite Permutit method and Ion exchange method and comparison of methods,						
	1.3	boiler problems-scale, sludge, caustic embitterment and corrosion, priming and foaming their causes and prevention, internal treatments, Numerical problems on hardness by EDTA method.						
2		**Lubricants**	04	10	2	40%	40%	20%
	2.1	Lubricant, Lubrication, Function of lubricant, Mechanisms of lubrication, Types of lubricants: solid, semi solid and liquid lubricants,						
	2.2	Ideal lubricant and properties: Viscosity, Viscosity index, fire point, flash point, pour point, cloud point, Saponification value, Acid value.						

3		**Alloys**	04	10	3	40%	40%	20%
	3.1	Defination, Preparation methods, purpose of alloy, types: Ferrous & Non Ferrous alloy, Ferrous alloy: Steel, Alloy steel, Composition, Properties and uses						
	3.2	Non Ferrous alloy: Alloy of Cu, Zn, Al, Sn, Pb Composition, Properties and uses						
SECTION-II								
Unit & Sub-Unit		**Topics/Sub-topics**						
4		**Corrosion**	**07**	**15**	**4**	40%	40%	20%
	4.1	Introduction, Types of corrosion (dry and wet corrosion), types and mechanism of Atmospheric corrosion, oxide films, factors affecting the corrosion,						
	4.2	electrochemical corrosion, mechanism of factors electrochemical corrosion, types of electrochemical corrosion: galvanic corrosion and concentration cell corrosion,						
	4.3	protective measures against corrosion: coatings (galvanic and zinc, organic coating agents, Electroplating, metal cladding,).						
5		**Fuels**	07	15	5	40%	40%	20%
	5.1	Definition, combustion and chemical principles involved in it, Classification of fuel, calorific value, ignition temperature and characteristics properties of good fuel, Solid Fuels: Types of coals, selection of coal, Proximate and ultimate analysis of coal						
	5.2	Liquid Fuels: Petroleum: its chemical composition and fractional distillation, cracking of heavy oil						

		residues – thermal and catalytic cracking, Gaseous Fuels: Composition and properties of Natural, coal gas, LPG						
6		**Superconductors**	04	12	6	40%	40%	20%
	6.1	Introduction to superconductors, types, LTSC: BCS theory, HTSC, structure of and preparation of 1: 2: 3 system, properties and uses						
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.*

List of Practicals/Assignments/Tutorials:

Sr. No.	Practical/Assignment	Approx. Hours	CO
1	To estimate the amount of iron in plain carbon steel alloy.	2	7,8
2	To estimate the amount of copper in Brass alloy	2	7,8
3	To estimate the amount of zinc in Brass alloy.	2	7,8
4	To estimate of hardness of water by EDTA complexometric titration.	2	7,8
5	To estimate amount of chloride in tap water by Mohr's Method	2	7,8
6	To determine saponification value of given oil.	2	7,8
7	To determine acid value of given lubricating oil.	2	7,8
8	To determine relative viscosity of given oil.	2	7,8
9	To determine flash point value of given lubricating oil using Able's apparatus.	2	7,8
10	To determine flash point value of given lubricating oil using Penksy Martin's apparatus.	2	7,8

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

Text Books:

Sr. No.	Title	Publisher and Edition
1	XIth standard Chemistry book	HSC Board, M.S. / NCERT
2	XIIth standard Chemistry book	HSC Board, M.S. / NCERT

Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1	Jain & Jain	Engineering Chemistry	Dhanpat Rai & Co. (Pvt.) Delhi – 110006 Ltd Edition: Fifteenth (2008)
2	Shashi Chawla	A Text Book of Engineering Chemistry	Educational & Technical Publishers Dhanpat Rai & Co. (Pvt.) Ltd, Edition: Third (2005)
3	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)

Curriculum Coordinator **Head Diploma in Mech Engg** **Dean - Diploma**

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE ★ MATUNGA MUMBAI-19

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: TECHNICAL COMMUNICATION AND PRESENTATION SKILLS
COURSE CODE	: 174HM24

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
-	-	2	2	-										25	10	25

Course Objectives:

Making students proficient in oral skills through various activities that will enable them to perform efficiently during interviews, meetings, seminars, conferences, group discussions and in negotiations and conflict resolutions. Improving the technical communication through critical analysis of a situation, drawing appropriate conclusions, presenting them precisely . Developing the personality of the future technologists by inculcating proper interactive skills in them and improving their power of expression required for efficacious communication in verbal and non-verbal form to achieve success in professional world.

Course Outcomes:

Student should be able to

CO1	To develop oral skills and self confidence
CO2	To develop analytical ability and technical communication skills
CO3	To develop interactive skills and power of expression

Course Content :

Unit & Sub-Unit	Topics/Sub-topics		Hours	Marks	CO	R Level	U Level	A Level

	UNIT 1	I. ORAL SKILLS a)Dialogue And Role Play b) Group Discussion c) Elocution d) Extempore	• To improve interactive skills & conversational skills • Leadership qualities and Team spirit • To boost self-confidence, Power of expression,	12	09	1	30%	30%	40%
	UNIT 2	II.TECHNICAL COMMUNICATION a) Editing b) Critical-Analysis of articles /write up. c) Report Writing /Drafting proposals	• Writing Sills • To develop critical thinking and analytical ability. • Developing technical communication and conciseness in writing	10	07	2	20%	20%	60%
	UNIT 3	III. GROOMING AND INTERACTIVE SKILLS a)Audio-visual Communication ➢ Language Laboratory ➢ Power Point Presentation ➢ Videos b) Communication and Body language ➢ Kinesics ➢ Haptics ➢ Proxemics ➢ Vocalics ➢ Chronemics c) Manners and Etiquette ➢ Table Manners ➢ Telephone Etiquettes ➢ Personal Grooming	Acquiring refined language and self-learning techniques. Using technologies to collect, compile, analyse and present data precisely in an appealing manner. Developing ability to communicate efficiently and effectively. Moulding and enhancing one's personality.	10	09	3	20%	30%	50%

		➢ Voice Culture							
		Total =		32	25				
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.*

List of Practicals/Assignments:

Writing a dialogue based on the given situation.

Dialogue delivery through Role Play

Conducting group discussion on a given topic

Writing critical analysis of an article

Writing short reports pertaining to industry

Drafting applications as per industry situations

Drafting proposals

Delivering a speech in public

Presentation skills through power point presentation on a given topic

Phonetics exercises in language laboratory

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1.	Board of Editors L.V Shende, T.K Tytus, N.S Pathan, R.G Munghate, Azizul Hugue, Sambhaji Warkad	The Communicator	Orient Blackswan,2008
2.	L.V Shende, T.K Tytus, N.S Pathan, R.G Munghate, Azizul Hugue, Sambhaji Warkad	Vibrant English	Orient Blackswan,2013

Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1.	Gupta C. B.	Contemporary Management	APH, New Delhi, First edition, 1992
2.	Sekaran Uma	Organisational Behaviour	Tata Mcgraw Hill, New Delhi, Second edition,2008
3.	Raman Meenakshi, Sharma Sangeeta	Technical Communication	OUP, India, Second impression, 2004
4.	K. Purushotham	English for Fluency	Orient Blackswan,2013

Curriculum Coordinator **Head Diploma in Mech Engg** **Dean - Diploma**

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE MATUNGA MUMBAI-19

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: Engineering Mechanics
COURSE CODE	: 174ME25

Teaching & Examination Scheme

TEACHING SCHEME				EXAMINATION SCHEME												
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	5	3	80	32	20	100	40	-	-	-	-	25	10	125

Course Objectives:

This course in Engineering Mechanics is designed to cover the applications of the principles of Mechanics of Engineering in general and Civil engineering in particular. This deals with static forces on the structures and bodies in motion and principles of equilibrium.

The laboratory 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.

Course Outcomes:

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 Center Of gravity and Centroid. 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. Understand the concept of kinetics and solve the numerical based on work, power and energy.
CO3	Study simple machines. Understand MA, VR, efficiency of simple Machines. Perform the experiments based simple machines and plot the graphs from the obtained results to find law of machine..

Course Content:

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.	02	03	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	13	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, simply supported & over hanging beams	07	13	1	30	30	40
4	4.1	Center of gravity and centroid: Definition centroid of regular plane area and their combinations, Center of gravity of simple solids: Cube, Cylinder, Prism, Sphere, Cone and their combinations.	08	11	1	30	40	30
SECTION-II								
Unit & Sub-Unit		Topics/Sub-topics						
5	5.1	Graphic Statics: Representation of a force, Bow's Notation, Space Diagram, Force diagram, Funicular polygon, Condition of equilibrium, Reaction of beams subjected to uniformly distributed and concentrated	05	07	1	30	40	30

		loads, centroid of a plane area.						
6	6.1	Friction: Laws of friction, terms used: Co-efficient of friction, angle of friction, repose, equilibrium of bodies on level and inclined planes.	05	07	1	30	30	40
7	7.1	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.	03	07	2	30	30	40
8	8.1	Angular Motion: Definition, Angular displacement, Angular velocity, Angular acceleration, Tangential and Radial components equations of circular motion, Relation between rectilinear and circular motion super elevation	04	06	3	30	40	30
9	9.1	Work, Power and Energy: Definition of terms, form of energy, law of conservation of energy, Relation between force, mass & acceleration and its application.	03	06	2	30	30	40
10	10.1	Simple Mechanics: Definition of terms used: mechanical advantage, velocity ratio, efficiency, friction in the machine , law of machine, conditions of the reversibility, study of simple machines : simple screw jack, axle and wheel, differential axle and wheel, worm and worm wheel, single purchase crab.	04	07	3	30	30	40
Numerical Questions will be asked on all of the above topics.								

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.

List of Practicals/Assignments/Tutorials:

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1	1	Law of polygon of forces	2	1
2	2	Reaction of Simply supported Beams.	2	1
3	3	Forces in jib crane.	2	1
4	4	Simple screw jack.	2	3
5	5	Differential axle and wheel	2	3
		Two half-imperial size drawing sheets in the graphic static with minimum five problems out of the following:		
6	6.1	Resultant of concurrent forces.	1	1
	6.2	Resultant of parallel forces	1	1
7	7.1	Resultant of non-concurrent, non-parallel forces.	1	1
	7.2	Reactions of a simply supported beam.	1	1
8	8.1	Equilibrium of bodies.	1	1
9	9.1	Centroids of plane areas	1	1
* Minimum 8 and maximum 12 Practicals/Experiment sessions to be included in a course in a term				

Text Books:

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.

Reference books and Websites:

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 Diploma in Mech Engg** **Dean - Diploma**

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE ★ MATUNGA MUMBAI-19

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: Engineering Drawing-II
COURSE CODE	: 174ME26

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME											
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
2	-	4	6	3	80	32	20	100	40	-	-	-	-	50	20	150

Course Objectives:

The student will able to

Understand the fundamentals of Engineering Graphics

Read and interpret object drawings.

To develop ability to handle and use drafting software.

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.

Course Content:

SECTION-I							
Unit &Sub-Unit	**Topics/Sub-topics**	**Hours**	**Marks**	**CO**	**R Level**	**U Level**	**A Level**
1	Projections of Solids Projections of solids with axis inclined to one reference plane & parallel to other reference plane. (Solids – prisms, pyramids, cylinder, cone & cube)	8	16	2,3	40	30	30
2	Sections of Solids Sections of solids by different auxiliary (Straight) cutting planes perpendicular to one reference plane, True shape of section. (Solids with axis perpendicular to one reference plane) (No problems with given true shape of section)	6	16	2,3	40	30	30
3	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	8	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)	6	15	2	40	30	30
5	Reading of Simple Orthographic Projections Missing Views including Sectional Views of simple	6	20	3	40	30	30

	machine parts (Full Section in one view)						
6	Machine Elements- Free hand sketching. I.S. Convention for internal & external threads, single start threads, hexagonal & square-nuts, bolts & washers; Set screws, conventions for drilled through & blind holes, tapped holes.	1	5	1	40	30	30
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.*

List of Practicals / Assignments / Tutorials :

Sr. No.	Unit	Practical/Assignment	Approx. Hours	CO
1	A	Eight sheets on projections of solids	16	1,2,3
	B	Five sheets on problems sections of solids	12	1,2,3
	C	Five sheet on problems on development of surfaces.	10	1,2,3
	D	Five sheets on isometric projections.	10	1,2,3
	E	Six sheets on problems from reading orthographic projections.	14	1,2,3
	F	One sheet on free hand sketches.	2	1

Note - The students should workout the problems on the following topics preferably on quarter imperial drawing sheets during the practical.

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	N.D.Bhat	Engineering Drawing	Charotar Publishers 53rd Edition 2010

2	S.T.Ghan, M.V.Rawalani	Engineering Drawing	Nirali Publications Edition -2014/1

Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1	D.A.Jolhe	Engineering Drawing	TATA McGraw Hill- 2008
2	K.R.Mohan	Engineering Graphics	Dhanpatrai publishing co. Ist edition-2009

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VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE MATUNGA MUMBAI-19

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: Basic Workshop Practice II
COURSE CODE	: 174ME27

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
0	-	3	3	-	-	-	-	-	-	-	-	-	-	50	20	50

Rationale:-

Electrical and Electronics diploma student is expected to know basic workshop practice like Wood working and hot working processes. The students are required to identify, operate and control various machines. The students are required to select and use various tools and equipments related to Wood working and smithy processes.

Course Objectives:

1. To lay a strong foundation in study and practice of basic workshop processes which is the backbone in Engineering.
2. To make students well versed to identify, select and use various marking, measuring, holding, striking and cutting tools & equipments.

Course Outcomes:

Student should be able to

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

List of Practicals:

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**METAL TURNING**	12	14	1	2	2	10
	1.1	Demonstration of Lathe machine.						
	1.2	Demonstration of various parts of Lathe machine.						
	1.3	One simple job involving plain turning						
2		**WOOD TURNING**	12	12	3	3	2	8
	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.						
3		**FITTING SHOP:**	12	12	2	2	2	8
	3.1	Demonstration of different fitting tools and drilling machines and power tools.						
	3.2	One simple fitting job involving practice of chipping, filing, drilling, tapping, cutting etc.						
4		**SHEET METAL SHOP**	12	12	2	2	2	8
	4.1	Demonstration of different sheet metal tools / machines.						
	4.2	Demonstration of different sheet metal operations like sheet cutting, bending, edging, end curling, lancing, soldering and riveting.						
	4.3	One simple job involving sheet metal operations and soldering and riveting						

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

Reference books :

Sr. No.	Author	Title	Publisher and Edition
1	K.C.John	Mechanical Workshop Practice	PHI Learning Pvt Ltd. EEE 2010
2	B.S. Raghuwanshi	Workshop Technology	Dhanpat Rai and sons, New Delhi, 9 th Edition, 2002
3	S.K. Hajra Chaudhary	Workshop Technology Vol I & II	Media Promotors and Publisher, New Delhi. 8 th edition , 1986

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VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE ★ MATUNGA MUMBAI-19

DIPLOMA PROGRAMME	: DIPLOMA IN MECHANICAL ENGINEERING
PROGRAMME CODE	: DME
SEMESTER	: SECOND
COURSE TITLE	: COMPUTER AIDED DRAFTING
COURSE CODE	: 174ME28

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME											
L	T	P	CR	PAPER HRS	TH		IST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
1	0	2		-	-	-	-	-	-	-	-	-	-	25	10	25

Course Objectives:

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. In the recent scenario; where computers have become leading tools in preparations engineering drawings; the students on current generation should also possess an ability to use computers for making mechanical engineering drawings. 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.

Course Outcomes:

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.

Course Content:

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: MODIFY PROPERTIES: Several properties of an entity can be modified as follows: Color, Linetype, Lineweight, Layer, Dimension, Text matter, Angle , Scale etc	2	3	2	0	50	50
	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.	2	2	2	50	0	50

		TEXT MODIFICATION: Select a text→modify/properties.						
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: Horizontal and Vertical dimensions can be put after specifying location of both extension lines. Aligned: This is used for putting inclined dimensions. Ordinate: Dimension are put from fixed datum lines along x and y. Angular: An angle between two lines or subtended by an arc can be put in by this. Baseline: H / V dimensions are put such that they share common 'first extension line'. Continue: The H / V dimensions are put such that consecutive dimension lines have common extension line. Leader: This is used for putting text with arrow heads while naming the objects etc. Center mark: The center mark for circle or arc can be put using this command. Align text: The text put in the dimension can be shifted to the sides or can be inclined by this command	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: (Dimension) Following settings are done from dialogue box. Modify: Lines and arrows: Color, lineweight and size of dimension and extension line, shapes of arrowheads, size of center mark etc can be changed from here. Text: Height, style, color, placement alignment etc related to dimension text can be changed from here. Fit: Overall scale of dimension and other fitting and placement options can be set from here. Units: Setting of unit type and its precision level can	2	3	3	0	50	50

		be set from here. Tolerances: Formats of tolerances like limits, deviation, symmetric can be set. Accordingly its upper and lower values and position can be set. After setting the dimension style as per custom needs; the style can be named such that it can be recalled when needed. The newly set dimension style can be applied to dimensions already appearing on the screen by using 'update'(If done through 'override') dimensions already appearing on the screen (if done through 'modify')						
4	4.1	**PRINT: (File)** Options in dialogue box: Plot device: To choose printer which is hooked to the PC by selecting suitable name. Plot settings: To set different variables as follows: Drawing orientation: Landscape (horizontal) or Portrait (Vertical) This is paper holding method. Plot scale: This sets the scale of output drawing w.r.t. paper size. To set paper size and units Window: For selecting desired portion of the drawing for printing purpose. Plot offset: This is used to shift the drawing position (V/H) on the paper before taking printout. Plot preview: (full is recommended) Shows how a drawing will appear on the paper as a preview, which can be adjusted before taking a print; if not satisfactory. 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).								

List of Practicals/Assignments/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 – understnding related commands and settings required	2	4

Text Books:

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

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