Programme	:	**Diploma in CE/EE/ME/MT**
Programme Code	:	**01/02/04/05/15/16/18/19**
Name of Course	:	**Engineering Mechanics**
Course Code	:	**AM261**

Teaching Scheme:

	Hours /Week	Total Hours
Theory	04	64
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests; each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	--	25	25

Course Rationale:

To find solutions to various practical problems, it is essential for the student to study and get acquainted with the various aspects in Statics and Dynamics. The fundamental concepts to be studied in this course are required for study of Strength of Materials, Mechanics of Structures and other courses of Mechanical & Civil Engineering to be studied at higher level.

Course Objectives:

After studying this course, the student will be able to,

- Understand various concepts & principles in Engineering Mechanics.
- Apply those principles for evaluating various problems coming across various fields of engineering

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weigh tage
1	**Introduction**			
	1.1	Fundamental Concept such as Fundamental units, Derived unit, system of Units, Scalars, Vectors.	02	02
	1.2	Mechanics, Statics, Dynamics, Kinematics, Kinetics.		
	1.3	Gravity, Mass, Weight, Inertia, Newton's Law of Gravitation and Newton's Law of motion.		
2	**Resolution and composition of Forces**			
	2.1	Concept of force, unit force, graphical representation, Principle of transmissibility.	08	12
	2.2	System of forces, coplanar, non coplanar, concurrent, non-concurrent, parallel.		
	2.3	Resolution of a force, resolved parts, orthogonal and non-orthogonal components of a force.		
	2.4	Concept of composition & resultant of forces.		
	2.5	Law of Parallelogram of Forces, Triangle law of Forces, Polygon law of forces.		
	2.6	Moment of a force, Varignon's Theorem, couple & characteristics of couple.		
	2.7	Composition of Coplanar forces- Concurrent, parallel (like & unlike) non concurrent forces by analytical methods		
3	**Equilibrium**			
	3.1	Concept of equilibrium, equilibrant, Relation between resultant & equilibrant. Analytical conditions.	08	12
	3.2	Equilibrium of coplanar concurrent forces, Lami's theorem and its application.		
	3.3	Equilibrium of coplanar parallel and non-concurrent forces.		
	3.4	Beam reactions - simply supported beams subjected to concentrated and distributed loads, beam supported on roller and hinge supports, overhanging beams.		
4	**Graphic Statics**			
	4.1	Concept of equilibrium, equilibrant, Relation between resultant & equilibrant. Analytical conditions.	06	08

	4.2	Equilibrium of coplanar concurrent forces, Lami's theorem and its application.		
	4.3	Equilibrium of coplanar parallel and non-concurrent forces.		
5	**Centroid and Centre of gravity**			
	5.1	Concept of Centre of Gravity & Centroid.	06	08
	5.2	Centroid of regular plane areas & compound areas consisting of regular plane areas. Centroid of hollow solids such as hollow cylinder, hollow cone, hollow sphere.		
	5.3	Centre of gravity of simple solids-cylinder, prism, cone, sphere etc. and C.G. of compound solid objects made up of simple solids.		
6	**Friction**			
	6.1	Introduction to friction.	08	10
	6.2	Types of friction, Laws of static friction, coefficient of friction, angle of friction, and angle of repose.		
	6.3	Equilibrium of body on horizontal & inclined planes.		
	6.4	Ladder friction.		
7	**Kinetics**			
	7.1	Concept of force, mass, acceleration, momentum, impulse & impact.	08	10
	7.2	Types of friction, Laws of static friction, coefficient of friction, angle of friction, and angle of repose.		
	7.3	Principle of Conservation of momentum, principle-its application, recoil velocity of gun.		
8	**Work, Power, Energy**			
	8.1	Definitions and units of work, graphical representation of work, work done by torque, work done by constant and variable force.	08	08
	8.2	Energy, forms, law of conservation of energy, work-energy principle and its applications.		
	8.3	Power-Definition, units.		

9	Simple Machines			
	9.1	Definition of simple machine, mechanical advantage, velocity ratio, efficiency. Relation between them, friction in machines.	10	10
	9.2	Reversibility, law of machine, max MA & max efficiency.		
	9.3	Study of machine – levers, pulleys, wheel and axle, screws, worm & worm wheel, winches, gears etc.		
		Total	64	80

List of Practicals/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1	Law of Polygon of Forces.	02
2	Law of Moments.	02
3	Lami's Theorem.	02
4	Beam Reactions.	02
5	Graphic statics-Two Problems each on composition of concurrent and parallel forces.	06
6	Graphic statics-Two Problems on beam reactions.	04
7	Centroid of Regular and irregular Laminas.	02
8	Determination of coefficient of friction for different surfaces.	02
9	To study various lifting machines – Differential axle and wheel, Worm and worm wheel, Simple screw jack, Single purchase crab, Double purchase crab.	10
	Total	32

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Introduction	Lecture method, Demonstration
2	Resolution and composition of Forces	Lecture method, Demonstration
3	Equilibrium	Lecture method, Transparencies
4	Graphic Statics	Lecture method, Transparencies
5	Centroid & Center of Gravity	Lecture, Demonstration & Discussion
6	Friction	Lecture method, Demonstration
7	Kinetics	Lecture method, Demonstration
8	Work, power, Energy	Lecture method, Demonstration
9	Simple lifting machines	Lecture method, Demonstration

Text Books:

Sr. No	Author	Title	Publication
1	Junnarkar, Adavi	Applied Mechanics	Charotar Publishers
2	Dadhe, Jamdar, Walawalkar	Applied Mechanics	Sarita Prakashan
3	Khurmi	Applied Mechanics	S. Chand

Reference Books:

Sr. No	Author	Title	Publication
1	Beer & Johnson	Vector Mechanics For Engineers (Statics & Dynamics)	Mc - Graw Hill Co., USA
2	McLean & Nelson (Schaum's Series)	Engineering Mechanics	Mc - Graw Hill Co., USA
3	Timoshenko & Young	Engineering Mechanics	Mc - Graw Hill Co., USA

Learning Resources: Books, Models

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Introduction	02	--	--	02
2	Resolution and composition of Forces	02	04	06	12
3	Equilibrium	02	02	08	12
4	Graphic Statics	04	04	--	08
5	Centroid & Center of Gravity	02	02	04	08
6	Friction	02	02	06	10
7	Kinetics	02	02	06	10
8	Work, power, Energy	02	02	04	08
9	Simple lifting machines	02	04	04	10
	Total	20	22	38	80

(Prof. R.M.Koranne)
Prepared By

(Prof. S. B. Kulkarni)
Secretary, PBOS

(Prof. P.B.Kamble)
Chairman, PBOS

Programme : **Diploma in CE/EE/ET/ MT/CM/IT**
Programme Code : **01/02/03/05/06/07/15/16/17/19**
Name of Course : **Basics of Computer Systems**
Course Code : **CM261**

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	--	--	2 hrs	--	2 hrs
Marks	--	--	50	--	25

Course Rationale:

In this world of high speed computing, it is essential for diploma in computer engineering students to know about device of computers, its operation and graphical base applications and latest technologies in the market. This course is designed for basic perspective for first year diploma students.

Course Objectives:

- Use computer system effectively.
- Describe and use different application software's.
- Use the basic functions of an operating system.
- Use five essential utility programs.
- Compare major OS like Linux and MS-Windows
- Understand working of input output devices.

- Understand working of secondary storage devices.
- Set the parameter required for effective use of hardware combined with and application software's
- Understand connectivity, internet multimedia and web.

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weigh tage
1	**Input and Output**			
	1.1	**What Is Input?**	04	--
	1.2	**Keyboard Entry**		
		Keyboards		
	1.3	**Pointing Devices**		
		Mouse, Joystick, Touch Screen, Light Pen, Stylus		
	1.4	**Scanning Devices**		
		Optical Scanners, Bar Code Readers, Character and Mark Recognition Devices		
	1.5	**Image Capturing Devices**		
		Digital Camera, Digital Video Camera		
	1.6	**Audio-Input Devices**		
		Voice		
	1.7	**Webcams and Instant Messaging**		
	1.8	**What Is Output?**		
	1.9	**Monitors**		
		Cathode-Ray Tube, Panel Monitor, Monitors		
	1.10	**Printers**		
		Features, Ink-Jet Printer, Laser Printer, Thermal Printer, Other Printers		
	1.11	**Audio-Output Devices**		
	1.12	**Combination Input and Output Devices**		
		Fax Machines, Multifunction Devices, Internet Telephone, Terminals		

	SECONDARY STORAGE			
	1.13	**Storage**		
	1.14	**Floppy Disks**		
		Traditional Floppy Disk, High Capacity Floppy Disks		
	1.15	**Hard Disks**		
		Internal Hard Disk, Hard-Disk Cartridges Hard-Disk Packs, Performance Enhancements		
	1.16	**Optical Disks**		
		Compact Disc, Digital Versatile Disc		
	1.17	**Other Types of Secondary Storage**		
		Solid-State Storage		
	1.18	**Making IT Work for You:**		
	1.19	**Music from the Internet**		
		Internet Hard Drives, Magnetic Tape		
	1.20	**Mass Storage Devices**		
	1.21	**A Look to the Future: Blu-Ray Technology and**		
	1.22	**Plastic Memory Expected to Replace DVD**		
2	**The System Unit**			
	2.1	**Electronic Data and Instructions**	02	--
		Binary Coding Schemes		
	2.2	**System Board**		
	2.3	**Microprocessor**		
		Microprocessor Chips ,Specialty Processors		
	2.4	**Memory**		
		RAM, ROM, CMOS		
	2.5	**System Clock**		
	2.6	**Expansion Slots and Cards**		
	2.7	**Making IT Work for You:**		
	2.8	**TV Tuner Cards and**		
	2.9	**Video Clips**		
	2.10	**Bus Lines**		
		Expansion Buses		
	2.11	**Ports**		
		Standard Ports, Cables		
	2.12	**Power Supply**		

3	System Software		04	--
	3.1	System Software		
	3.2	Operating Systems		
		Functions, Features, Categories, Windows Mac OS, UNIX and Linux		
	3.3	Utilities		
		Windows Utilities, Utility Suites		
	3.4	Device Drivers		
	3.5	Making IT Work for You: Virus Protection and Internet Security		
	3.6	A Look to the Future: IBM Builds an Aware		
4	Basic Application Software		20	--
	4.1	Application Software		
		Common Features, Web-based Applications		
	4..2	Making IT Work for You: Speech		
	4.3	Recognition		
	4.4	Word Processors		
		Features, Case		
	4.5	Spreadsheets		
		Features, Case		
	4.6	Database Management Systems		
		Features, Case		
	4.7	Presentation Graphics		
		Features, Case		
	4.8	Integrated Packages		
		Case		
	4.9	Software Suites		
	4.10	Sharing Data between Applications		
		Copy and Paste, Object Linking and Embedding		
	4.11	A Look to the Future: Web-based Application		
	4.12	Software Updates Ease Maintenance		
5	Information Technology		04	--
	5.1	Internet, and You (Only Introduction)		
	5.2	Information Systems		
	5.3	People		

	5.4	**Making IT Work for You:**		
	5.5	**Information Technology Topics**		
	5.6	**Software**		
		System Software, Application Software		
	5.7	**Hardware**		
		Types of Computers, Microcomputer Hardware		
	5.8	**Data**		
	5.9	**Connectivity, the Wireless Revolution, and the Internet**		
	5.9	**A Look to the Future: Using and Understanding**		
	5.10	**Information Technology Means Being Computer Competent**		
6	**The Internet, the Web, and Electronic Commerce**			
	6.1	**The Internet and the Web Access**	**04**	--
		Providers, Browsers		
	6.2	**Communication**		
		E-Mail, Instant Messaging, Discussion Groups		
	6.3	**Making IT Work for You:**		
	6.4	**Blocking Spam**		
	6.5	**Search Tools**		
		Search Engines, Meta search Engines, Specialized Search Engines		
	6.6	**Electronic Commerce**		
		Web Storefronts, Web Auctions, Security		
	6.7	**Web Utilities**		
		Telnet, FTP, Plug-ins, Filters		
	6.8	**A Look to the Future:Internet2 Is a High-Performance Network**		
7	**Specialized Application Software (only Introduction)**			
	7.1	**Specialized Applications**	**02**	--
	7.2	**Graphics**		
		Desktop Publishing, Image Editors, Illustration Programs, Image Galleries, Graphics Suites		

	7.3	**Audio and Video Multimedia** Links and Buttons, Developing Multimedia Presentations, Making IT Work for You: Digital Video Editing, Multimedia Authoring Programs		
	7.4	**Web Authoring** Web Site Design, Web Authoring Programs		
	7.5	**Emerging Applications** Virtual Reality, Knowledge-based (Expert) Systems, Robotics		
	7.6	**A Look to the Future: The Future of Artificial**		
8	**Communications and Networks (Only Introduction)**			
	8.1	**Communications**		
		Connectivity, The Wireless Revolution, Communication Systems		
	8.2	**Communication Channels**		
		Physical Connections, Wireless Connections		
	8.3	**Connection Devices**		
		Modems , Connection Service		
	8.4	**Data Transmission**		
		Bandwidth, Protocols		
	8.5	**Networks**		
		Terms	**06**	--
	8.6	**Network Types**		
		Local Area Networks, Home Networks, Metropolitan Area Networks, Wide Area Networks		
	8.7	**Network Architecture**		
		Configurations		
	8.8	**Making IT Work for You: Home Networking Strategies**		
	8.9	**Organizational Internets: Intranets and Extranets**		
		Intranets, Extranets, Firewalls		

	8.10	**A Look to the Future: Toyota and Sony Create Wireless Robotic Car**		
9	**Cyber Law & Cyber Security**			
	9.1	Introduction to Cyber Security, Security issues related to Information, Internet Security, Data Security and Information Security. Cyber Law associated with violation of security.	**02**	--
		Total	**48**	--

List of Practicals/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1	**Demonstrate types of Computers.**	02
	Demonstrate use of various I/O Devices. **(Maximum Devices Available in the LAB as per theory should be demonstrated)**	
	Functioning of Cathode Ray Tube, TFT/Flat Monitors and other monitors	
	Introduction of interface of other output devices like Fax Machines, Internet phones, Digital Camera etc.	
	Functioning of various types of Audio-Output Devices.	
2	**Functions and working of Secondary Storage devices**	04
	Types of Secondary Storage devices.	
	Installation, configuration and setting of Hard Disks.	
	BIOS Settings for Primary and secondary Memory.	
	Installation and working of CD-ROM/DVD-ROM/ DVD-Combo/ DVD-Writer (Internal and External).	
	Future of Secondary Storage Devices.	
3	Practice of basic commands in command window: Ex: dir, md, copy, cd, move, rmdir, rd etc.	04

4	**Operating System**	04
	Various operations on Window based operating system.	
	Windows Operations: Minimising, Maximising, Resizing.	
	Using Windows Help.	
	Creating, copying, moving files and folders.	
	Creating shortcuts.	
	Creating and Removing/Deleting User Accounts.	
	Setting window views.	
	Using Add /Remove Programs Utility.	
	Using Add Hardware Utility	
	Adding Fonts.	
	Viewing Computer Configuration.	
	Desktop settings: Display properties, time and date setting, Screen Saver, Appearance	
5	**Application software**	07
	Word Processors	
	Hands on Word Processors.(Ex: MS WORD, OpenOffice.org)	
	Various options and its use in creating/ updating/ printing/ Adding Image/mail merge etc. (Perform at least 5 assignments Covering all menu items). Spreadsheets:	
	Assignments based on use of Spreadsheets &Various menu items and its use in worksheets to solve problems. (Perform at least 5 assignments using any spreadsheet software) Presentation Graphics:	
	Preparation of Various slides (Perform at least 5 assignments covering Presentation Graphics like objects grouping, Customising Slide transition, Embedding Links)	
6	**Database Management System**	07
	Creation of tables using DBMS tools like MS Access. (Teachers should frame their own assignments for above tools which covers maximum features provided by respective softwares).	

7	**Introduction to Internet and WWW**	
	Conduct minimum 2 assignments on Internet and Web, like creating mail accounts, using web based applications, browsing internet sites to fetch relevant information, etc.	02
	Introduction to e-Commerce and related web sites. Example Railway Reservations, Air Ticket Reservations etc..	02
	Total	32

Text Books:

Sr. No	Author	Title	Publication
1	Timothy J. O. Leary	Computing Essentials	TMH
2	Vikas Gupta	Comdex Computer Course Kit	Dreamtech

Reference Books:

Sr. No	Author	Title	Publication
1	Computer Fundamentals	BPB	P.K. Sinha
2	Information Technology for Management	Tata McGraw Hill	Henry C. Lucas, Jr.

Learning Resources: Books, Models

(Prof. Smt. M. H. Thakre)
Prepared By

(Prof. S. B. Kulkarni)
Secretary, PBOS

(Prof. P.B.Kamble)
Chairman, PBOS

Programme : **Diploma in EE/ET/MT**
Programme Code : **02/03/05/16/17/19**
Name of Course : **Programming in C**
Course Code : **CM262**

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests, each of 60 minutes	3 Hrs.	--	--	--
Marks	20	80	50	--	--

Course Rationale:

In this era of high speed computing, it is necessary to program computers with the help of structured & dynamic languages like 'C' to study programming is useful in solving problems/tasks related to various domains. Now days almost every setup in software engineering domain chooses 'C' as a basic tool to develop software.

Course Objectives:

After studying this course, the student will be able to

- Write a programs using 'C' language
- Implement data types & structures related to problems.
- Solve the problems/tasks in structured way.

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
1	**Overview of 'C'**			
	1.1	Introduction: development of 'C', Importance of 'C', Basic structure of 'C' programs, programming style, sample 'C' programs, execution of 'C' program	02	05
2	**Data Types & Character set**			
	2.1	Character set, C tokens, keywords & identifiers, constants, variables. Data types, declaration of variables, assigning values to variables, defining symbolic constants.	04	10
3	**Operators & Expressions**			
	3.1	Operators: Arithmetic, relational, logical, increment & decrement, conditional, bit-wise special.	06	10
	3.2	Expressions: Arithmetic expressions, evaluation of expressions, procedure of arithmetic operators, type conversions in expressions, operator precedence & associatively, mathematical functions.		
	3.3	Managing input & output operators: Introduction, reading a character, writing a character, formatted input, formatted output.		
4	**Decision Making**			
	4.1	Branching & looping introduction, decision making with if statement, simple if statement, the if-else statement, The else if ladder, The switch statement, The?: operator, the go to statement, looping , introduction , the while statement , jumps in the loop, break statement.	06	08
5	**Arrays**			
	5.1	Introduction, one- dimensional arrays, two-dimensional arrays, multidimensional arrays, Initialization of arrays.	07	08

6	**Strings**			
	6.1	Introduction, declaring & initializing string variables, reading string, writing strings, arithmetic operations on string , putting strings together , comparison of two strings, string handling functions, table of strings	**06**	**08**
7	**User defined functions**			
	7.1	Need of user defined function, the types of C functions, return values & their types, calling a function.	**08**	**15**
	7.2	Category of functions: No argument- No return value, Argument-No return value, No argument-return value & No argument- return value.		
	7.3	Handling non-integer functions, nesting of functions, recursion, and unction with arrays.		
8	**Structures & Unions**			
	8.1	Structure definition, giving values to members, structure initialization. Unions, size of structures and unions, Application of Structure and union.	**06**	**08**
9	**Introduction to Pointers**			
	9.1	Pointer Concept,& and * operators, Declaration of Pointers, Initialization of pointers, Pointer Expressions, Application of pointers	**03**	**08**
		Total	**48**	**80**

List of Practical/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1	**Demonstration of Turbo-C Compiler, Creating a program,** Compiling & linking executing programs.	02
2	Write 'C' programs based on declaring variables & assigning values to variables. (Minimum 2)	02
3	Write programs based on expressions and operators. Programs using scanf(), printf(), getch(), putch().(Minimum 4)	02
4	Programs using following control statements: If statement, Switch statements, ?: operator, go to statements Programs using following loop controls, while loop, do.. while loop, for loop. (Minimum 5)	06

5	Write programs based on arrays. (Minimum 3)	04
6	Write programs using strings operations such as comparison, concatenation, copying etc. (Minimum 2)	04
7	Examples on User defined functions, demonstration of return data types. Write programs demonstrating four categories of functions. Programs based on recursion & nesting of functions. (Minimum 2)	04
8	Write programs based on structure definition and initialization. and union definition and initialisation. (Minimum 1)	04
9	Write programs based on declaration, initialisation and use of pointers in expressions. (Minimum 1)	04
	Total	**32**

Note :

- Minimum 20 Programs as specified in practical coverage section should be executed.
- Actual program statements on practical topics should be based on the respective Programme offering the course and their requirements.

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Overview of 'C'	Demonstration of 'C' Compiler, Create simple program
2	Data types & character set	Write 'C' programs based on declaring variables & assigning values to variables.
3	Operators & Expressions	Explanation of operators, expressions & managing i/p & o/p operators.
4	Decision Making	Theoretical explanation + writing program using different control statements.
5	Arrays	Theoretical explanation & implementation of arrays.
6	Strings	Theoretical explanation & implementation of strings.
7	User defined functions	Explanation & implementation of examples on user defined functions,
8	Structures and Unions	Theoretical explanation & implementation of structures & Unions.
9	Introduction to Pointers	Explanation & implementation of basic examples on Pointers

Text Books:

Sr. No	Author	Title	Publication
1	E. Balagurusamy	Programming in ANSI 'C'	Tata- McGraw Hill pub.(Second Edition)

Reference Books:

Sr. No	Author	Title	Publication
1	Author	Title	Publisher
2	Yeshwant Kanetkar	Let us 'C'	BPB Publication
3	Madhusudhan Mothe	C for Beginners	SPD Publication

Learning Resources: Black Board, Transparencies, Overhead projector, LCD, White Board.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Overview of 'C'	02	01	02	05
2	Data types & character set	03	03	04	10
3	Operators & Expressions	03	03	04	10
4	Decision Making	02	04	02	08
5	Arrays	03	03	02	08
6	Strings	02	03	03	08
7	User defined functions	04	05	04	15
8	Structures and Unions	03	02	03	08
9	Introduction to Pointers	04	03	03	08
	Total	**26**	**27**	**27**	**80**

(Prof.Smt.J.R.Hange)
Prepared By

(Prof. S. B. Kulkarni)
Secretary, PBOS

(Prof. P.B.Kamble)
Chairman, PBOS

Programme : **Diploma in CE/ME/MT**
Programme Code : **01/04/05/15/18/19**
Name of Course : **Engineering Graphics**
Course Code : **ME262**

Teaching Scheme:

	Hours /Week	Total Hours
Theory	02	32
Practical	04	64

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests, each of 60 minutes	4 hrs.	--	--	--
Marks	20	80	--	--	25

Course Rationale:

Engineering drawing is the graphical language. It is used by engineers, designers, planners, supervisors and also the workers to express their thoughts, ideas and concepts. The expression by drawing is very accurate, precise and brief. At a glance one can understand detailed description of any part to be manufactured or a dam to be built or an electric circuit to be used. For all technicians through understanding of principles of engineering drawing (Graphic Skills) is essential.

Course Objectives:

After studying this course, the student will be able to

- Draw various engineering curves.
- Incorporate Indian Standards in drawings.
- Sketch various orthographic and isometric views.
- Draw all different views from given components vis-á-vis.
- Draw free hand sketches.

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
1	**Introduction of Drawing Instruments, Lines, Letters etc.**			
	1.1	Use of different drawing equipments.	02	–
	1.2	Type of letters.		
	1.3	Conventions of lines.		
	1.4	Scales.		
2	**Curve and Tangential Exercises**			
	2.1	Geometrical constructions and tangential exercises.	03	12
	2.2	To draw an ellipse by concentric circle method.		
	2.3	To draw a parabola by : i) Directrix focus method.		
	2.4	To draw a hyperbola by : i) Directrix focus method.		
	2.5	To draw in volute of circle.		
	2.6	To draw a cylindrical helix (limited to two turns)		
	2.7	To draw cycloid, epicycloids and hypocycloid.		
3	**Orthographic Projections**			
		Introduction to orthographic projections first and third angle method of projection. Conversion of simple pictorial view, Dimensioning technique.	06	12
4	**Sectional Orthographic Projections**			
		Introduction, converting the given pictorial view into sectional views.	04	12
5	**Missing Views**			
		Interpretation of orthographic view, drawing of missing views from given two orthographic views	03	08
6	**Projection of Lines, Planes and Solids**			
		Axis inclined to one plan only Concept of true length of a line, projection of Planes, & Regular solids such as Cylinder, Prism Cone and Pyramid.	06	12
7	**Isometric Views**			
	7.1	Isometric scale and isometric views of simple objects.	06	12
	7.2	Isometric views of rectangular, cylindrical objects, Slots on sloping surface.		

8	Free Hand Sketches			
		Fasteners, temporary threaded fasteners, locking arrangement, Foundation Bolts.	02	12
		Total	32	80

List of Practicals/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
Six sheets on topics covered in the syllabus.		
1	Line letters and numbers. (Sheet No.1)	06
2	Engineering curves and tangential exercises. (Sheet No.2)	06
3	Orthographic projection, Sectional views (Sheet No.3)	16
4	Missing views. Projection of lines, planes and solids (Sheet No.4)	12
5	One sheet Isometric projection. Minimum Two Problems. (Sheet No.5)	16
6	Free hand sketches. (Sheet No.6)	08
	Total	64

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Introduction to Drawing instruments lines letters etc.	Classroom teaching and Demonstration.
2	Curves and tangential exercises	Demonstrations and classroom teaching.
3	Orthographic projection	Use of models and classroom teaching.
4	Sectional views	Use of models, transparencies and classroom teaching.
5	Missing views	Classroom teaching, self study and assignments.
6	Projection of lines, planes and solids	Classroom teaching and assignments.
7	Isometric views	Classroom teaching and use of models.
8	Free hand sketches	Classroom teaching and assignments & use of Models.

Text Books:

Sr. No	Author	Title	Publication
1	N.D. Bhatt	Elementary Engg. Drawing (Including plan and solid geometry)	Charotar Publication, Anand.
2	Mali, Choudhary	Engineering Drawing	Vrinda Prakashan, Jalgaon

Reference Books:

Sr. No	Author	Title	Publication
1	N.D. Bhatt	Geometrical and Machine Drawing	Charotar Publication, Anand.
2	--	I.S. 696 Latest version	B.I.S.
3	Curriculum Development Centre, TTTI, Bhopal	A Workbook in Engineering Drawing	Somaiyya Publication Pvt. Ltd., Mumbai
4	--	SP 46 – 1988	B.I.S.
5	G.R. Nagpal	Machine Drawing	--
6	K. Venugopal	Engineering Drawing and Graphics + AutoCAD	New Age International Publishers.

Learning Resources: Video cassettes No. 122, 123 of G.P.P. Library

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Introduction to Drawing instruments lines letters etc.	--	--	--	--
2	Curve and Tangential exercises	12	--	--	12
3	Orthographic Projection	--	12	--	12
4	Sectional views	--	12	--	12
5	Missing views	--	--	08	08
6	Projection of lines, planes and solids	--	12	--	12
7	Isometric views	--	--	12	12
8	Free hand sketches	12	--	--	12
	Total	**24**	**36**	**20**	**80**

(Prof.M.R.Mundhe)
Prepared By

(Prof. S. B. Kulkarni)
Secretary, PBOS

(Prof. P.B.Kamble)
Chairman, PBOS

Programme : **Diploma in ME/MT**
Programme Code : **04/05/18/19**
Name of Course : **Elements of Electrical Engineering**
Course Code : **EE263**

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests, each of 60 Min. duration	03 Hrs	--	--	--
Marks	20	80	--	--	25

Course Rationale:

Every branch of engineering is related with electrical Engineering. Therefore every engineering student is expected to know fundamentals of Electrical Engineering. From this point of view, this course is introduced.

Course Objectives:

After studying this course, the student will be able to

- Understand the basic and fundamental principle of Electrical engineering
- Know the various electrical circuits concept used in higher-level courses.
- Know principle and construction of various electrical machines and transformers.
- Measure electrical quantity.

Course Content:

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
1	**Electrical Circuits:**			
	1.1	Introduction to electrical power supply system, A.C. supply –single phase and three phase, DC supply.	08	12
	1.2	Concept of Electric Circuit, D.C. Current, A.C. Current, Ohm's Law.		
	1.3	Resistances in series, voltage division formula for two resistances in series.		
	1.4	Resistances in parallel, current division formula for two resistances in parallel.		
	1.5	Kirchhoff's laws- Kirchhoff's current law (KCL), Kirchhoff's Voltage Law (KVL) (Simple Numerical with two equation)		
	1.6	Effect of temperature on resistance, temperature co-efficient of resistance (Simple Numericals)		
2	**Magnetic Circuit**			
	2.1	Definition of magnetic flux, magnetic circuit, magneto motive force (MMF) reluctance, permeability, relative permeability, magnetic flux density.	06	10
	2.2	Magnetization curve (B-H Curve), Magnetic hysteresis, hysteresis loop, hysteresis loss.		
	2.3	Production of mechanical force on current caring conductor placed in magnetic field. Fleming's Left hand rule.(Simple numericals)		
	2.4	Comparison between electric circuit and magnetic circuit.		
	2.5	Concept of series and parallel magnetic circuit.		
3	**Electromagnetic Induction**			
	3.1	Faradays laws of Electromagnetic Induction	04	06
	3.2	Statically (self & mutual) induced e.m.f & Dynamically induced e.m.f		
	3.3	Lenz's law, Fleming's right hand rule.		

4	**A.C. Fundamentals**			
	4.1	Generation of single phase A.C.Voltage (Elementary Single Phase alternator), sinusoidal waveform & its graphical representation.	**08**	**12**
	4.2	Definitions: Waveform, cycle time period, frequency, angular frequency, phase & phase difference, maximum value, r.m.s. Value, average value, peak factor, form factor.		
	4.3	Purely resistive circuit, purely inductive circuit, and capacitive circuit.		
	4.4	A.C. Series circuit i) R-L ii) R-C iii) R-L-C series circuit. iv) R-L-C resonance.		
	4.3	Concept of true power, reactive circuit apparent power, power factor. (No derivation but simple Numericals)		
5	**Three Phase Circuit**			
	5.1	Generation of three phase A.C. Voltage (Elementary 3-phase alternator)	**04**	**08**
	5.2	Concept of phase sequence.		
	5.3	Advantages of 3-phase supply over single-phase supply.		
	5.4	Types of connection Star & Delta Relation between line and phase values of voltage and current in i) Star ii) Delta connected three phase balanced system.(No derivation) (Simple Numerical).		
6	**Electrical Measuring Instruments and measurement**			
	6.1	Connection of D.C. / A.C. Ammeter, D.C. /A.C. Voltmeter & their connection in D.C. Circuit.(For PMMC & MI Instruments, their identification from its dial)	**05**	**10**
	6.2	Connection of wattmeter, frequency meter, p.f. meter and energy meter in A.C. circuit.		
	6.3	Concept of C.T. & P.T., Measurement of high current in A.C. circuit with low range ammeter and C.T., Measurement of high voltage in A.C. with low range voltmeter and P.T.		

7	**Single Phase Transformer**			
	7.1	Definition, principal of working, construction, Types of transformer.	**05**	**10**
	7.2	E.M.F. equation, Transformation ratio, Voltage ratio, current ratio, turns ratio, KVA rating, Rated full load current calculations (Simple numericals)		
	7.3	Losses in transformer, efficiency, voltage regulation.		
	7.4	Autotransformer: Construction, working principles and applications.		
8	**D.C. Motor**			
	8.1	Importance of motors as an electrical drives.		
	8.2	Definition, principal of working and construction of d.c. Motors.		
	8.3	Types of D. C. Motors.		
	8.4	Applications.		
	8.5	**A.C. Motors.** Three Phase induction motor: Principle & working, construction, types, slip speed, connection of three phase I.M. and reversal of rotation of I.M. applications.		
	8.6	Single phase induction motor: Principal of working types of single-phase induction motor, applications.		
		Total	**48**	**80**

List of Practical/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1	To verify Kirchhoff's laws	04
2	To determine temperature rise of resistance of metal.	02
3	To plot the B-H curve of a magnetic material	02
4	Demonstration of production of mechanical forces on current carrying conductor in magnetic field & verify Fleming's Left hand rule.	02
5	Demonstration on Faraday's Laws of Electromagnetic Induction by using coil and magnet & verify Fleming's right hand rule.	02
6	To observe waveforms of A.C. Voltage and current on CRO	02

7	To measure voltage across each parameters of R-L-C series circuit and draw vector diagram. Also find impedance of circuit.	02
8	Draw the vector diagram for R-L-C series resonance circuit and determine the P.F. and current of circuit.	02
9	To verify the relation between phase values and line values of voltages and currents in three phase Star & Delta connected balanced load.	04
10	Connection & readings of Wattmeter and Energy meter in A.C. circuit.	04
11	Measurement of High current in A.C.Circuit with. low range ammeter and C.T.	04
12	To determine efficiency and voltage regulation of single-phase transformer by direct loading method.	02
13	Reversal of rotation of three phase Induction Motor.	02
	Total	**34**

NOTE : Minimum 12 Practical's are to be conducted & at least one from each Chapter

Instructional Strategy :

Sr. No.	Topic	Instructional Strategy
1	Electrical Circuits	Lecture, problem solving, practical
2	Magnetic circuits	Lecture, Q/A technique.
3	Electromagnetic induction	Lecture, problem solving
4	AC Fundamentals	Lecture, problem solving
5	Three phase circuits	Lecture, problem solving, practical, Q/A technique.
6	Electrical Measuring Instruments and measurement.	Lecture, problem solving, practical
7	Single-phase Transformers.	Lecture, problem solving, practical
8	Motors	Lecture, problem solving, practical

Text Books:

Sr. No	Author	Title	Publication
1	M.V. Deshpande	Elements of Electrical Engineering	
2	B.L. Theraja	Electrical Technology Vol. I and II	S. Chand & Co.

Reference Books:

Sr. No	Author	Title	Publication
1	Hirst	Applied Electricity	
2	H.Cotton	Electrical Technology	CBC, Delhi
3	Edvard Hughes	Electrical Technology	Pearson Education.
4	B. H. Deshmukh	Electrical Technology	Nirali Prakshan
5	A.K. Shawhney	Electrical Electronics Measurements & Instrumentation	Dhanpat Rai & Sons

Learning Resources: Models, charts, books, Videocassettes. no.140, 141, 142, 145, 146, 157, 209, 210, 268, 271, 385, 386, 406, 410 of G.P.P. library, Transistor Data Manuals, CD no. 418 & 419 of GPP Library.

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Electrical Circuits	02	04	06	12
2	Magnetic circuits	02	04	04	10
3	Electromagnetic induction	02	04	00	06
4	AC Fundamentals	02	04	06	12
5	Three phase circuits	02	02	04	8
6	Electrical Measuring Instruments and measurement.	04	02	04	10
7	Single-phase Transformers.	04	02	04	10
8	Motors	04	04	04	12
	Total	**22**	**26**	**32**	**80**

(Prof. K.M. Kakade)
Prepared By

(Prof. S. B. Kulkarni)
Secretary, PBOS

(Prof. P.B.Kamble)
Chairman, PBOS

Programme : **Diploma in ME/MT/CM/IT**
Programme Code : **04/05/06/07/18/19**
Name of Course : **Elements of Electronics Engineering**
Course Code : **ET262**

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests, each of 60 minutes	3 hrs.	--	--	--
Marks	20	80	--	--	25

Course Rationale:

This course will be useful in understanding of construction, working and applications of semiconductor devices and circuits.

Course Objectives:

After studying this course, the student will be able to

- Explain construction, working, characteristics and applications of semiconductor devices and circuits.
- Build and test the circuits

Course Content;

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
1	**Semiconductor devices**			
	Concept& principles of electronics devices			
	1.1	**Rectifying diode :** Review of P - type and N - type semiconductor, PN junction, Barrier voltage, depletion region, Junction Capacitance **Forward biased & reversed biased junction** Diode symbol, forward & reversed Characteristics of PN junction diode **Specifications :** Forward voltage drop, Reverse saturation current, maximum forward current, power dissipation, Package view of diodes of different power ratings (to be shown during practical hours)	15	20
	1.2	**Zener diode :** construction, Symbol ,characteristics (forward & reversed) Avalanche & zener breakdown **Specifications :** Zener voltage, power dissipation, break over current,dynamic resistance & maximum reverse current (to be shown during practical hours)		
	1.3	**Rectifier :** Half wave and Full wave Rectifier, circuit diagram, working, comparison, merits and demerits. Filters, necessity, types, comparison, merits, demerits.		
	1.4	**Transistor :** construction, symbol, operating principle, characteristics, applications, rating and specifications, configurations, comparison between CB, CE, CC.		
	1.5	**UJT :** Construction, symbol, operating principle, characteristics, applications, rating and specifications.		
	1.6	**FET:** Construction, symbol, operating principle, characteristics, applications, rating and specifications, configurations, comparison.		

	1.7	**SCR :** Symbol, their construction, working, characteristics, applications		
2	**Oscillator**			
	2.1	Block diagram, Barkhausan Criteria for sustained oscillations, classification: LC and RC. Oscillations in LC tank circuit; Hartley, Colpitts. RC Wein Bridge and Phase shift, Oscillator. Crystal Oscillator.	**07**	**12**
3	**Digital Fundamentals**			
	3.1	Number systems: Decimal, Binary, Hexadecimal, Octal.	**07**	**12**
	3.2	Basic logic gates: AND, OR, NOT, NAND, NOR, EXOR symbols, IC numbers and Truth Table.		
	3.3	Logic families : TTL, CMOS		
	3.4	Boolean Algebra: Fundamentals of Boolean algebra, Basic laws, De Morgan`s theorem,		
4	**Linear ICs**			
	4.1	OP AMP. IC 741, symbol, pin diagram, ideal and typical characteristics, Applications such as Inverting , Non Inverting amplifier, Difference amplifier, adder substractor , Integrator, differentiator.	**07**	**12**
	4.2	Timer IC 555: Block diagram, operating modes viz. Astable, Monostable.		
5	**Instrumentation**			
	5.1	CRO: Cathode Ray Tube, Oscilloscope Block diagram, operation, oscilloscope specifications, Applications.	**05**	**12**
	5.2	Function generator, Block diagram, operation, specifications, applications		

6	Transducer			
	6.1	Definition, classification: Active, Passive, Primary, Secondary, Mechanical, Electronic, Analog, Digital, Selection criteria, Resistive, Capacitive, Inductive, Transducers(LVDT), Photoelectric, Piezoelectric Transducers, proximity switch, Construction, Operation, One example of each, Applications,	07	12
		Total	48	80

List of Practicals/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1	Plot V-I characteristics of P-N junction diode.	02
2	Study of Half wave and Full wave rectifier with and without filter.	02
3	Plot the i/p and o/p characteristics in CE configurations.	02
4	Plot the characteristics of FET.	02
5	Plot the characteristics of UJT.	02
6	Plot the characteristics of SCR.	02
7	Study of Hartley and Colpitts oscillator.	02
8	Study of RC phase shift and Wein Bridge.	02
9	Study of logic gates and verifications of logic gates.	02
10	Verification of De Morgan's theorem.	02
11	Study of Inverting and Non Inverting Amplifier.	02
12	Study of Adder, Substractor.	02
13	Study of Integrator and Differentiator.	02
14	Study of astable multivibrator using 555.	02

15	Study of C.R.O.	01
16	Study of Function generator.	01
17	Study of Transducers.	02
	Total	**32**

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Semiconductor devices.	Classroom teaching and laboratory work.
2	Digital fundamentals.	Classroom teaching and laboratory work.
3	Linear IC's.	Classroom teaching and laboratory work.
4	Oscillator.	Classroom teaching and laboratory work.
5	Instrumentation.	Classroom teaching and laboratory work.
6	Transducer.	Classroom teaching and laboratory work.

Text Books:

Sr. No	Author	Title	Publication
1	Albert Malvino.	Basic Electronics.	TMH.
2	Katre.	Basic Electronics.	Tech-Max.
3	B.L.Theraja.	Basic Electronics.	S.Chand.
4	Ramakant Gaikwad	Linear Integrated Circuits	PHI
5	R P Jain	Modern Digital Electronics	TMH
6	A K Sawheny	Instrumentation	DHANPAT RAI & SONS

Reference Books:

Sr. No	Author	Title	Publication
1	Mottershed	Electronics Devices and Circuits.	PHI
2	Milmann Halkies	Electronics Devices and Circuits.	TMH

Learning Resources: Reference Books, Data Manual

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Semiconductor Devices	10	06	04	20
2	Oscillators	04	06	02	12
3	Digital Fundamentals	06	04	02	12
4	Linear I C 's	06	04	02	12
5	Instrumentation	06	04	02	12
6	Transducers	06	04	02	12
	Total	**38**	**28**	**14**	**80**

(Prof. R.M.Adhav)
Prepared By

(Prof. S. B. Kulkarni)
Secretary, PBOS

(Prof. P.B.Kamble)
Chairman, PBOS

Programme : **Diploma in CE/MT**
Programme Code : **01/05/15/19**
Name of Course : **Workshop Practice**
Course Code : **WS261**

Teaching Scheme:

	Hours /Week	Total Hours
Theory	--	--
Practical	04	64

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	--	--	--	--	--
Marks	--	--	--	--	50

Course Rationale:

To make the students conversant with use of various workshop tools used in smithy, carpentry, fitting, welding and plumbing shops.

Course Objectives:

After studying this course, the student will be able to

- Interpret the assigned job drawing.
- Identify various tools used in different shops of Work shop.
- Select appropriate tool set to perform a specific job.
- Acquire skills to use various tools.
- Take care and maintain the tools.

Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Weightage
1	**Sketch of smithy/forging Hand tools,** Equipments, with construction and Application.	08	05
2	**Sketch of carpentry hand & power tools,** Equipment with construction and application	14	10
3	**Sketch of fitting and filling hand tools,** equipment with construction and application	14	10
4	**Sketch of welding hand tools,** Equipment with construction and application.	14	10
5	**Sketch of plumbing hand tools,** equipment with construction and application.	14	10
6	Journal writing and submission on above given topics	--	05
	Total	**64**	**50**

List of Practicals/Experiments/Assignments:

Sr. No.	Name of Practical/Experiment/Assignment	Hrs
1	Demo of job involving minimum three operations. e.g. Upsetting, Drawing Down, Bending, Setting down.	08
2	One useful carpentry job involving carpentry joints and wood turning	14
3	One useful fitting job involving Marking, Filing, Sawing, Drilling, Tapping	14
4	One useful welding Job Involving welding joints.	14
5	One job in plumbing of pipe threading and pipe joints.	14
	Total	**64**

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1	Smithy and forging	Explanation, Demonstration, exhibition of Models/samples pieces.
2	Carpentry	
3	Fitting and filling	
4	Welding	
5	plumbing	

Text Books:

Sr. No	Author	Title	Publication
1	Mali and Ghan	Elements of electrical and mechanical technology(Mechanical technology portion)	Nirali and Pragati Prakashan
2	Deshmukh Mandke	Elements of electrical and mechanical technology(Mechanical technology portion)	Nirali Prakashan
3	Choudhari M.A.	Elements of electrical and mechanical technology(Mechanical technology portion)	Sandeep Prakashan, Pune

Reference Books:

Sr. No	Author	Title	Publication
1	S. K. Hajara Choudhari A. K. Hajara houdhari	Elements of workshop technology – Vol. I	Media promoters and Publishers Pvt. Ltd., Mumbai-7
2	V. Kapoor	Workshop practice Manual	Dhanpat Rai and sons, New Delhi – 32
3	B. S. Raghuwanshi	A course in workshop technology Vol-I	Dhanpat Rai and sons, New Delhi – 32.

Learning Resources: Demonstration kit, charts, models/sample pieces and books. video cassette no.134 and 367 of G.P.P. library

Specification Table:

Sr. No	Topic	Cognitive	PSYCHOMOTOR			Total
		Knowledge	Imitation	Manipulation	Perfection	
1	Smithy and forging	5	--	--	--	5
2	Carpentry	3	2	3	2	10
3	Fitting and filling	3	2	3	2	10
4	Welding	3	2	3	2	10
5	Plumbing	3	2	3	2	10
6	Journal writing and submission on above given topics	5	--	--	--	5
	Total	**25**	**25**	**25**	**25**	**50**

(Prof. Hamid Zaheer)
Prepared By

(Prof. S. B. Kulkarni)
Secretary, PBOS

(Prof. P.B.Kamble)
Chairman, PBOS