

Scheme and Syllabus
of
Programme
on
DIPLOMA
IN
MECHANICAL ENGINEERING
(AICTE APPROVED)
INDUSTRY PARTNER: JBM GROUP
(2024-2027)

By

Department of Automotive Studies
Skill Faculty of Engineering & Technology



Programme Co-ordinator: - Ms. Ekta

Shri Vishwakarma Skill University

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Table 1 as per the suggestions of BoS members:

Table 1

S.No.	Category Suggested Breakup of Credits by AICTE		Breakup of Credits in one year of Diploma Scheme
1	Humanities & Social Sciences courses	*8	4
2	Basic Science courses	*19	18
3	Engineering Science courses	*15	12
4	Program Core courses (Branch specific)	*45	7
5	Program Elective courses (Branch specific)	*12	
6	Open Elective courses (from other technical and /or emerging subjects)	*9	
7	Project work, seminar and internship in industry or elsewhere	*12	
8	Audit Courses [Environmental Sciences, Induction training, Indian Constitution, Essence of Indian Traditional Knowledge etc.]	(non-credit)	Environmental Science
	Total	120	

*Minor variation is allowed as per need of the respective disciplines.

Code	Nomenclature of Courses
HS	Humanities & Social Science
BS	Basic Science
ES	Engineering Science
PC	Program Core
PE	Program Elective
OE	Open Elective
AU	Audit Courses

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Scheme for Diploma Programme in Mechanical Engineering in the following Table 2

Table- 2

Semester-I																		
Category	Course Code	Course Name	Credits				Hrs/Week				Marks							
											Theory(T)			Practical(P)			Total	
			L	T	P	C	L	T	P	TO	I	E	TO	I	E	TO	(T+P)	
HS	24DENG01 24DENG02	*English Language and Communication Skills	1	0	1	2	1	0	2	3	15	35	50	35	15	50	100	
BS	24DMTH03	*Applied Mathematics-I	3	0	0	3	3	0	0	3	30	70	100	0	0	0	100	
BS	24DPHY03 24DPHY04	*Applied Physics-I	3	0	1	4	3	0	2	5	30	70	100	70	30	100	200	
ES	24DMEE05	***Engineering Graphics and Drawing	0	0	3	3	0	0	6	6	0	0	0	70	30	100	100	
ES	24DGEN05 24DGEN06	**Fundamentals of IT	3	0	1	4	3	0	2	5	30	70	100	70	30	100	200	
HS	24DYHS01	*Yoga and Health Skills-I	2	0	0	2	2	0	0	2	30	70	100	0	0	0	100	
ES	24DMEE14	Engineering Workshop Practice	0	0	2	2	0	0	4	4	0	0	0	70	30	100	100	
AU	24DEVS01	*Environmental Science	0	0	0	0	2	0	0	2	30	70	100	0	0	0	100	
Total			12	0	10	20	14	0	16	30	165	385	550	315	135	450	1000	
Semester-II																		
Category	Course Code	Course Name	Credits				Hrs./Week				Marks							
											Theory(T)			Practical(P)			Total	
			L	T	P	C	L	T	P	To	I	E	TO	I	E	TO	(T+P)	
BS	24DMTH04	*Applied Mathematics II	3	0	0	3	3	0	0	3	30	70	100	0	0	0	100	
BS	24DPHY05 24DPHY06	*Applied Physics-II	3	0	1	4	3	0	2	5	30	70	100	70	30	100	200	
BS	24DCHM03 24DCHM04	*Applied Chemistry	3	0	1	4	3	0	2	5	15	35	50	35	15	50	100	
ES	24DMEE15	Engineering Mechanics	3	0	0	3	3	0	0	3	30	70	100	0	0	0	100	
PC	24DMEE16	Workshop Technology -I	3	0	0	3	3	0	0	3	30	70	100	0	0	0	100	
PC	24DMEE17	Workshop Practice- I	0	0	4	4	0	0	8	8	0	0	0	70	30	100	100	
Total			15	0	6	21	15	0	12	27	135	315	450	175	75	250	700	
*Courses provided by SFASH																		
**Course provided by CSE/IT																		
***Common course with D.Voc. Mechanical Manufacturing																		

1 credit Theory and Tutorial= 15 Hrs.

1 Credit Lab = 30 Hrs.

*Courses will be provided by respective skill faculties.


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SYLLABUS

FIRST YEAR (SEMESTER-I)

DIPLOMA IN MECHANICAL ENGINEERING


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Course Title	Engineering Graphics and Drawing	Course Code)	24DMEE05			
Specialization	Engineering Sciences	Structure (LTPC)	0	0	3	3
Offered for	Diploma in Engineering and Diploma in Vocation	Status	Core ✓		Elective	
Faculty	Skill Faculty of Engineering And Technology	Type	New ✓		Modification	
Pre-requisite		To take effect from	2024-2025			
Submission date	24/07/2024	Date of approval by BoS	24/07/2024			
Course Objective:	The aim of this course is to develop drafting and sketching skills, to know the applications of drawing equipment and get familiarize with Indian Standards related to engineering drawings..					
Course Outcome:	<p>By the end of this course, the student will be able to:</p> <p>CO1. Understand the language of graphics and familiarize with Indian Standards related to engineering drawings</p> <p>CO2. Develop drafting and sketching skills & application of drawing equipments.</p> <p>CO3. Read various engineering curves, projections and dimensioning styles.</p> <p>CO4. Develop skills to translate ideas into sketches and draw.</p> <p>CO5. Develop skills to visualize actual object or a part of it, based on drawings.</p>					
Laboratory Content	<p>Unit 1: Introduction to Engineering Drawing Introduction to drawing instruments, materials, layout and sizes of drawing sheets and drawing boards.,Types of drawings: detail drawings, sub-assembly drawings, general arrangement drawings, installation drawings, exploded views. Different types of lines in Engineering drawing as per BIS specifications Practice of vertical, horizontal and inclined lines, geometrical figures such as triangles, rectangles, circles, ellipses and curves, hexagonal, pentagon with the help of drawing instruments.</p> <p>Unit 2: Dimensioning Technique Necessity of dimensioning, method and principles of dimensioning (mainly theoretical instructions) Dimensioning of overall sizes, circles, threaded holes, chamfered surfaces, angles, tapered surfaces, holes, equally spaced on P.C.D., counter sunk holes, counter bored holes, cylindrical parts, narrow spaces and gaps, radii, curves and arches Scales -their needs and importance (theoretical instructions), type of scales, definition of R.F. and length of scale Drawing of plain and diagonal scales</p> <p>Unit 3: Orthographic Projections and Sectioning Theory of orthographic projections (Elaborate theoretical instructions), Projection of points, lines, planes and geometric solids. Projection of nuts and bolts, rivets , threads and fasteners. Sectioning: Importance and salient features Drawing of full section, half section, partial or broken out sections, Offset sections, revolved sections and removed sections. Convention sectional representation of various materials, conventional breaks for shafts, pipes. rectangular, square, angle, channel, rolled sections Orthographic sectional views of different objects.</p>					

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Unit 4:**Isometric Views**

Fundamentals of isometric projections and isometric scale.

Isometric views of combination of regular solids like cylinder, cone, cube and prism and geometric features,

Unit 5:**Introduction to AutoCAD and GD&T****AutoCAD:**

Meaning, need of computer graphics, CAD, screen structure and toolbars in AutoCAD, coordinate system, Drawing Limits, Units.

LINE command, coordinates-Absolute, incremental, polar. POLYLINE, CIRCLE (3P,2P, TTR), ARC, ELLIPSE

Different geometrical commands for making figure e.g. triangle, rectangle, hexagon, pentagon, parabola.

Editing Commands-Scale, erase, copy, stretch, lengthen and explode.

Use of SNAP, GRID and ORTHO mode for selection of points quickly. Use of these modes while picking points in LINE, CIRCLE, PLINE, ARC, ELLIPSE etc commands.

Drawing projections of lines and solids.

Drawing orthographic projections of different objects (at least 2 sheets)

AutoCAD for the isometric views.

[Making single computer sheet showing all the three views and an isometric (in single split screen view) of any object showing understanding of use of AutoCAD in making isometric views – at least 1 sheet]

Draw the various Electrical circuit and panel layout using CAD software.

Geometric Dimensioning and Tolerances:

Introduction, symbols used for GD& T: Straightness, flatness, squareness, parallelism, roundness, cylindricity, non-contact profiling systems.

Surface finish: Introduction, terminology, specifying roughness on drawings, surface roughness parameters.

AutoCAD skill of student is evaluated in internal assessment only not in external exam.

Textbook	<ol style="list-style-type: none"> 1. PS Gill, "Engineering Drawing", SK Kataria & Sons, New Delhi. 2. ND Bhatt, "Elementary Engineering Drawing in First Angle Projection", Charotar Publishing House Pvt. Ltd., Anands. 3. T. Jeyapooan, "Engineering Drawing and Graphics using AutoCAD", Vikas Publishing House Pvt, Ltd Noida. 4. Sham Tickoo and D. Sarvanan, "AutoCAD : For Engineers & Designers", Wiley India Pvt.Ltd., Delhi
References	<ol style="list-style-type: none"> 1. Surjit Singh, "A Text Book of Engineering Drawing", Dhanpat Rai & Co., Delhi. 2. S.R.Singhal and O.P.Saxena, "A Text Book of Engineering Drawing", Asian Publisher, Delhi. 3. RB Gupta, "Engineering Drawing", Satya Prakashan, New Delhi.

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Course Title	Engineering Workshop Practice	Course Code	24DMEE14			
Specialization	Engineering Sciences	Structure (LTPC)	0	0	2	2
Offered for	Diploma	Status	Core <input checked="" type="checkbox"/>		Elective	
Faculty	Skill Faculty of Engineering And Technology	Type	New <input checked="" type="checkbox"/>		Modification	
Pre-requisite		To take effect from	2024-2025			
Submission date	24/07/2024	Date of approval by BoS	24/07/2024			
Course Objective:	<ul style="list-style-type: none"> To understand basic workshop practice. To understand the various types of wiring systems and connections. To understand, operate, and control the instruments and equipment with safety practices 					
Course Outcome:	<p>By the end of this course, the student will be able to:</p> <p>CO1. Acquire skills in basic engineering practice to identify, select and use various marking, measuring, and holding, striking and cutting tools & equipment's and machines</p> <p>CO2. Understand job drawings and complete jobs as per specifications in allotted time.</p> <p>CO3. Operate, control different instruments and equipment's with safety practices.</p>					
Laboratory Content	<p>Sheet Metal Working:</p> <p>i) Demonstration of different sheet metal tools / machines.</p> <p>ii) Demonstration of different sheet metal operations like sheet cutting, bending, edging, end curling, lancing, soldering, brazing, and riveting.</p> <p>iii) Preparation of One simple job involving sheet metal operations and soldering and riveting.</p> <p>Electrical House Wiring: Practice on simple lamp circuits</p> <p>(i) one lamp controlled by one switch by surface conduit wiring</p> <p>(ii) Lamp circuits- connection of lamp and socket by separate switches</p> <p>(iii) Connection of Fluorescent lamp/tube light</p> <p>(iv) simple lamp circuits-install bedroom lighting.</p> <p>(v) Simple lamp circuits- install stair case wiring.</p> <p>Demonstration:</p> <p>i) Demonstration of measurement of Current, Voltage, Power and Energy.</p> <p>ii) Demonstration of advance power tools, pneumatic tools, electrical wiring tools and accessories.</p> <p>iii) Tools for Cutting and drilling</p>					
References	<ol style="list-style-type: none"> S.K. Hajara Chaudhary, Workshop Technology, Media Promoters and Publishers, New Delhi, 2015 B.S. Raghuwanshi, Workshop Technology, Dhanpat Rai and sons, New Delhi 2014 K. Venkat Reddy, Workshop Practice Manual, BS Publications, Hyderabad 2014 Kents Mechanical Engineering Hand book, John Wiley and Sons, New York 					

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SYLLABUS
FIRST YEAR (SEMESTER-II)
DIPLOMA IN MECHANICAL ENGINEERING

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Course Title	Engineering Mechanics	Course Code	24DMEE15			
Specialization	Engineering Science	Structure (LTPC)	3	0	0	3
Offered for	Diploma	Status	Core <input checked="" type="checkbox"/>		Elective	
Faculty	Skill Faculty of Engineering And Technology	Type	New <input checked="" type="checkbox"/>		Modification	
Pre-requisite		To take effect from	2024-2025			
Submission date	24/07/2024	Date of approval by BoS	24/07/2024			

Course Objective: To understand about the fundamental laws of machines and their applications to various engineering problems. Understand the role of friction in equilibrium problems and find resultant of various forces.

Course Outcome: By the end of this course, the student will be able to:

- CO1. Identify the force systems for given conditions by applying the basics of mechanics
- CO2. Apply principle of moment to solve simple problems.
- CO3. Calculate the co-efficient of friction for different types of surfaces.
- CO4. Determine the centroid and moment of inertia of plain and composite lamina and solid bodies.
- CO5. Determine velocity ratio, mechanical advantage and efficiency of simple machines.

Course Content

Unit 1:
Laws of forces
 Definition of force, measurement of force in SI units, its representation, types of force: Point force/concentrated force & Uniformly distributed force, effects of force, characteristics of a force, Different force systems (coplanar and non-coplanar), principle of transmissibility of forces, law of superposition, Free body diagram, Composition and resolution of coplanar concurrent forces, resultant force, method of composition of forces, laws of forces, parallelogram law of forces (with derivation), triangle law of forces, polygon law of forces – graphically, analytically, resolution of forces, resolving a force into two rectangular components, Lami's theorem, Simple numericals, Equilibrium of forces and its determination

Unit 2:
Moment
 Concept of moment, Moment of a force and units of moment, Varignon's theorem (definition only), Principle of moment and its applications (Levers – simple and compound), Simple numericals. Parallel forces (like and unlike parallel force), calculating their resultant, Concept of couple, its properties and effects, General conditions of equilibrium of bodies under coplanar forces, Position of resultant force by moment,

Unit 3:
Friction
 Definition and concept of friction, types of friction, force of friction, Laws of static friction, coefficient of friction, angle of friction, angle of repose, cone of friction, Equilibrium of a body lying on a horizontal plane, equilibrium of a body lying on a rough inclined plane. Calculation of least force required to maintain equilibrium of a body on a rough inclined plane subjected to a force acting along the inclined plane and subjected to a force acting at some angle with the inclined plane. Simple numerical.

Unit 4:
Centroid and Moment of Inertia
 Concept, definition of centroid, Axis of symmetry, Reference axis. Determination of centroid of plain and composite lamina (T, L, C and I shape) using moment method only, centroid of bodies

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with removed portion. Concept of moment of inertia and second moment of area, Radius of gyration, Theorem of perpendicular axis and parallel axis (with derivation), Second moment of area of common geometrical sections : Rectangle, Triangle, Circle (without derivation); Second moment of area for L,T and I section.

Unit 5:

Simple Machines

Definition of effort, velocity ratio, mechanical advantage and efficiency of a machine and their relationship, law of machines, Simple and compound machine (Examples). Definition of ideal machine, reversible and self locking machine. Effort lost in friction, Load lost in friction, determination of maximum mechanical advantage and maximum efficiency; System of pulleys (first, second, third system of pulleys), determination of velocity ratio, mechanical advantage and efficiency. Working principle and application of wheel and axle, simple screw jack, worm and worm wheel. Expression for their velocity ratio and field of their application.

Textbook	<ol style="list-style-type: none"> 1. S. Ramamurtham, "A Text Book of Applied Mechanics", Dhanpat Rai Publishing Company Pvt. Ltd, Delhi. 2. R. S. Khurmi, "A Text Book of Engineering Mechanics (Applied Mechanics)", S Chand and Co. Ltd., New Delhi. 3. R. K. Rajput, "A Text Book of Applied Mechanics", Laxmi Publications, New Delhi.
References	<ol style="list-style-type: none"> 1. RS Khurmi, "Strength of Materials", S. Chand & Co; New Delhi. 2. Kirpal Singh, "Mechanics of Materials", Standard Publishers Distribution, New Delhi. 3. Birinder Singh, "Strength of Materials", Katson Publishing House, New Delhi. 4. D. R. Malhotra and H.C. Gupta, "Elements of SOM", Satya Prakashan, New Delhi.

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Course Title	Workshop technology-I	Course Code	24DMEE16			
Specialization	Professional Core Engineering	Structure (LTPC)	3	0	0	3
Offered for	Diploma	Status	Core ✓	Elective		
Faculty	Skill Faculty of Engineering And Technology	Type	New ✓	Modification		
Pre-requisite		To take effect from	2024-2025			
Submission date	24/07/2024	Date of approval by BoS	24/07/2024			
Course Objective:	The aim of this course is to develop in students an understanding of some of the key mathematical concepts usually taught at the class XI level.					
Course Outcome:	<p>By the end of this course, the student will be able to:</p> <p>CO1. Identify equipment of different welding processes.</p> <p>CO2. Apply the basic safety measures related to welding.</p> <p>CO3. Perform different welding inspection techniques.</p> <p>CO4. Understand basic drilling operations.</p> <p>CO5. Understand the fitting operations.</p>					
Course Content	<p>Unit 1: Welding Introduction: Definition, Classification, need advantages and disadvantages. Procedure, equipment and applications of: (i) Gas Welding (ii) Electric arc welding. (iii) Resistance welding. (iv) Thermit welding (v) Carbon arc gauging. (vi) Metal-Inert-Gas welding (MIG) (vii) Tungsten Inert Gas welding (TIG) Weldability: Definition of weldability, different aspects of welding, weldability tests, weldability of carbon steel, stainless steel and aluminium.</p> <p>Unit 2: Safety codes and practices related to welding Effect and protection from fumes and gases, chromium and Nickel in welding fumes, Radiation, noise shocks, safe storage, handling and use of gas cylinders, eye and face protection for welding and cutting operations.</p> <p>Unit 3: Inspection Testing of Welds & Relevant Welding Codes: (a) Destructive methods (b) Non-destructive methods-visual, X-ray, Y-ray, Magnetic particles, fluorescent, penetrant and ultrasonic testing. Non-destructive testing (NDT) of welding: die penetration test, radiography, magnetic particle inspection and ultrasonic inspection</p> <p>Unit 4: Drilling and Related operations Principle of drilling. Classification of drilling machines and their description. Various operation performed on drilling machine - drilling, spot facing, reaming, boring, counter boring, counter sinking, hole milling, tapping. Speeds and feeds during drilling, Types of drills and their features, nomenclature of a drill. Drill holding devices. Types of reamers.</p>					

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**Unit 5:
Fitting**


Introduction, various operations, marking and marking tools, hand tools and measuring tools, cutting tools and operations, fasteners. Basics of grinding process.

Textbook

1. T. L. Choudhary, "Workshop Technology Part – 1 & 2", Khanna Publishers, New Delhi, Sixth Edition, 2019.
2. S. K. Choudhry and Hajra, "Elements of Workshop Technology (Vol. I Manufacturing Processes)". Media Promoters and Publishers Pvt. Ltd., 2008.
3. B.S. Raghuwanshi, "A Course in Workshop Technology (Vol. I, Manufacturing Processes)", Dhanpat Rai and Sons, New Delhi, 2015.

References

1. R. K. Jain, "Workshop Technology Vol I & II", Khanna Publishers, New Delhi, First Edition, 2021.
2. P. N. Rao, "Manufacturing Technology Volume –I", Tata McGraw Hill, Delhi, Fifth Edition, 2019.


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Course Title	Workshop Practice-I	Course Code	24DMEE17			
Specialization	Professional Core Engineering	Structure (LTPC)	0	0	4	4
Offered for	Diploma	Status	Core <input checked="" type="checkbox"/>		Elective	
Faculty	Skill Faculty of Engineering And Technology	Type	New <input checked="" type="checkbox"/>		Modification	
Pre-requisite		To take effect from	2024-2025			
Submission date	24/07/2024	Date of approval by BoS	24/07/2024			
Course Objective:	The aim of this course is to develop skills in the students for operating various advance welding machines, fitting and drilling operations for supervising and optimal resource utilization.					
Course Outcome:	<p>By the end of this course, the student will be able to:</p> <p>CO1. Prepare the edges for welding and select the suitable electrode, voltage and current.</p> <p>CO2. Operate the welding transformer and generator to perform various weld joint operations.</p> <p>CO3. Prepare jobs for the fitting operations.</p> <p>CO4. Prepare jobs by drilling and related operations.</p>					
Laboratory Content	<p>Welding Safety Precautions and use of personal protective equipment (PPE), demonstration of tools and equipment to be used in welding. Specifications and type of welding machines available in lab. Classification, selection and coding of electrodes, welding parameters, welding joints and welding positions. Demonstration of tools, equipment, welding apparatus, and welding defects.</p> <ul style="list-style-type: none"> Striking arc practice for uniform deposit and straight beads on flat with different current values Preparation of T joint using MS plate with arc welding Preparation of butt/ lap weld using MIG and TIG welding Preparing gas welding joint in vertical/Horizontal position joining M.S. Plates Exercise on gas cutting of mild steel plate with oxy-acetylene gas torch. <p>Fitting Safety Precautions and use of personal protective equipment (PPE), demonstration of tools and equipment Demonstration and Function of holding/ clamping devices, hand tools and cutting tools, marking and measuring tools and instruments (surface plate, try square, caliper, steel rule, scribe and Vernier caliper). Introduction to various types of threads (internal and external), drills, taps and dies.</p> <ul style="list-style-type: none"> To fit hacksaw blade in its frame and perform hacksawing operation by using marking media and marking tool and straight sawing practice. To perform filing on MS workpiece for giving it a perfect rectangular shape and drilling, tapping operation. To perform step filing operation at right angle on MS workpiece. Make & assemble sliding fit with straight sides "T" fit. File and fit, combined fit with straight, angular surface with ± 0.05 mm accuracy, check taper angle of tapered job with sine bar. Making external threads on a pipe by using die and PVC/GI pipe connection using nipple and socket. Fasten mechanical components / sub assemblies together using screws, bolts and collars 					

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using hand tools

Drilling:

Safety Precautions and use of personal protective equipment (PPE), demonstration of tools and equipment. Demonstration and Function of hand tools used in Drilling and related operations.

- Practice the Grinding of drill angle.
- To prepare the jobs by drilling operations
- To prepare job by tapping the operation
- To prepare job by boring operation.
- Precision drilling, reaming and tapping. Counter sink, counter bore and ream on M.S flat.
- Locate and make accurate hole for stud fit.


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English Language and Communication Skills

Course Credit: 01(1--0)

Max. Marks: 50(15I+35E)

Course Code: 24DENG01

Objectives:

- To enhance the language and communication competence of learners with an emphasis on English for Specific Purposes (ESP) through communication skills related activities.

Learning Outcomes: After this course, the learners will be able to

- Communicate effectively in diverse situations.
- Frame sentences for their professional and personal communication needs.
- Draft meticulous resumes, letters, minutes and presentations.
- Comprehend and understand intermediate level of passages and audios.

Units	Topics
I Communication Skills	Meaning, Process and Types of Communication; Principles of Effective Communication;
II Grammar and Vocabulary	Use of Tenses, Articles, Prepositions, Conjunctions, Subject-verb concord, Word formation: Base, Prefixes, Suffixes Synonyms, Antonyms, One-word substitutes
III Listening Skills	Process and types of listening, deterrents to listening process, Essentials of good listening. Listening Comprehension and Note-Taking
IV Writing Skills	Report writing, Agenda and Minutes; Letter Writing: Business letters, Cover letters, Electronic mail; Resume Writing
V Speaking Skills	Preparing for interviews- Types of interviews, Group discussion; Effective ways of performing well in interviews; Public Speaking

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Recommended Readings:

- Joseph, C. J., Myall, E. G., and A. Biswas, eds. *A Comprehensive Grammar of Current English*. New Delhi: Inter University P, 2014.
- Lata, Pushp, and Sanjay Kumar. *Communication Skills*. 2nd ed. New Delhi: OUP, 2019.
- Monippally, Matthukutty, M. *Business Communication: From Principles to Practice*. New Delhi: McGraw Hill Pub., 2018.
- Mukerjee, H. S. *Business Communication: Connecting at Workplace*. New-Delhi: Oxford University Press, 2012.
- Murphy, H. A., Hildebrandt, H.W., and Thomas, J.P. *Effective Business Communication*. Boston: McGraw-Hill Companies, 1997.
- Ramesh, Gopaldaswamy, and Mahadevan Ramesh. *The Ace of Soft Skills: Attitude, Communication and Etiquette for Success*. Noida: Pearson, 2019.
- Sandra, M. O. *Handbook of Corporate Communication and Strategic Public Relations: Pure and Applied*. New Delhi: Routledge, 2004.
- Sinha, K. K. *Taxmann's Business Communication*. 4th Revised ed. New Delhi: Taxmann's Pub., 2018.
- Sinha, R. P. *Current English and Usage with Composition*. New Delhi: OUP, 2013.
- Taylor, Grant. *English Conversation Practice*. Indian ed. Chennai: McGraw Hill Education Pvt. Ltd., 2017.

Paul Singh. Kumar DL

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English Language and Communication Skills Practical

Course Credit: 01(0-1-0)

Max. Marks: 50(35I+15E)

Course Code: 24DENG02

Course Objective: This course is designed to strengthen the communication abilities of the learners by providing them hands-on practice.

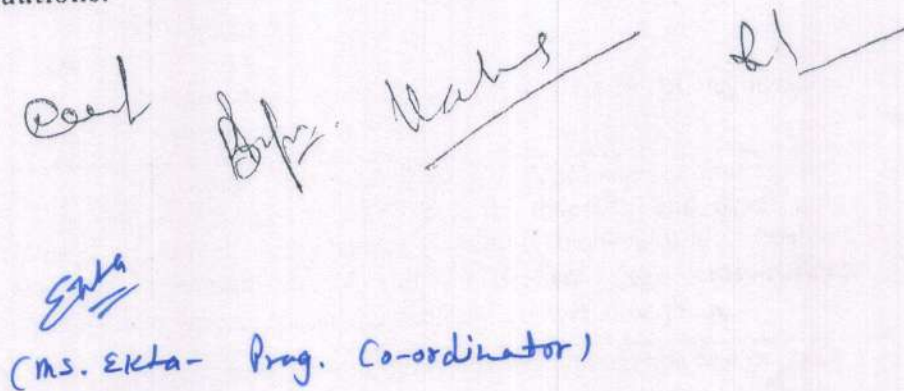
Learning Outcomes: After completing this course, the learners will be able to

- 1) Demonstrate knowledge and understanding of a range of professional or public communication situations.
- 2) Perform effectively in diverse professional and public communication situations like interviews and negotiations, drafting emails and resume etc.

Details:

1. Situational Conversations
2. Listening Skills
3. Resume Writing
4. Mock Interviews
5. Group Discussion
6. Presentation Skills
7. Negotiation Skills
8. Email Writing
9. Public Speaking

Note: The teacher should play the role of the facilitator and allow the learners maximum time to practice these activities. The focus should be primarily on helping the learners overcome the LSWR barrier and gradually move towards honing these skills to enable the learners use them in professional communication situations.



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(UG Certificate) For D. Voc/Diploma

Course Title – Yoga and Health Skills- I

Course Credit: 02 (2-0-0)

Course Code:24DYHS01
Max. Marks: 100(30I+70E)

Objectives:

- To enable the student to have knowledge of Yoga.
- To possess emotional stability.
- To attain higher level of consciousness.

Learning Outcomes: After the completion of the course, the learners will be able to

- 1: Know and understand about basic Yoga.
- 2: Apply the knowledge of about different school of yoga to practice it traditionally.
- 3: Explaining the importance of health.
- 4: Apply knowledge of yoga asana for mental, physical and social well-being.
- 5: Understand the need of mediation techniques to practice it on daily basis.

Unit	Statement
1 Introduction to Yoga	Yogic Prayer Mantra, Meaning and Definition of Yoga, Aim and Objectives of Yoga, Misconceptions of Yog. Importance of Yoga in modern era.
2 Yoga Practices	Raja Yoga (Ashtanga Yoga), Bhakti Yoga, Karma Yoga, Hatha Yoga.
3 Health	Meaning, definition, yogic lifestyle, importance of yoga in health protection, measures to increase immunity.
4 Yogic Management in Health Problems	Cervical, Back Pain, Diabetes and Stress.
5 Meditation	Meaning, Types, Importance, General Instructions And Suggestions For Meditation, Physical, Mental and Spiritual Effects Of Meditation.

TEXT BOOKS

1. Yoga & yogic chikitsa - Singh Prof. Ramharsh , Chaukhamba Sanskrit pratishthan, Edition 2011
2. Swami Vivekananda: Jnana Yoga, Bhakti Yoga, Karma Yoga, Raja Yoga, Advaita Ashrama, Calcutta, 2002.
3. Prof. Ramharsh Singh -SwashthavrittaVigyan, Chaukhambha Sanskrit Prakashan, Varanasi, 1998.
4. Sriram Sharma Acharya- JivemSharadahShatam, AkhandJyoti Mathura 1998.
5. Prof. Ramharsh Singh-Yogewam Yogic Chitksha, Chaukhambha Sanskrit Prakashan, Varanasi, 1998.
6. SwasthaVrittaVigyanewam Yogic Chiktsha- Dr. RakeshGiri, SikhshaBharti, Uttrakhand.

REFERENCE BOOKS

1. Swami Kuvalyananda: Asana, Kaivalyadhama, Lonavla, 1993
2. Swami Satyananda Saraswati: Asana, Pranayama, Bandha, Mudra, Bihar School of Yoga, Munger, 2006
3. Basavaraddi, I.V. & others: YOGASANA: A Comprehensive description about Yogasana, MDNIY, New Delhi, 2011.
4. Basavaraddi, I.V. & others: Yogic Sukshma Evam Shthula Vyayama, MDNIY, New Delhi, 2011.

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(MS. EICHA - Prog. Co-ordinator)

Course Title: Yoga and Health Skills-I

Course Code: YTH-101

Course Credit: 1.00
Exam Marks: 100/100

After the completion of this course, the student will be able to:

- 1. Explain the concept of Yoga and its importance in health.
- 2. Describe the various types of Yoga and their benefits.
- 3. Demonstrate the basic asanas and pranayama techniques.
- 4. Apply the knowledge of Yoga in the management of various health conditions.
- 5. Evaluate the role of Yoga in promoting overall health and well-being.

Sl. No.	Topic	Weightage
1	Introduction to Yoga	10%
2	Types of Yoga	10%
3	Asanas and Pranayama	40%
4	Yoga in Health Management	30%
5	Conclusion	10%

The course is designed to provide a comprehensive understanding of Yoga and its application in health management. It covers the theoretical aspects of Yoga, including its history, philosophy, and various forms. The practical component focuses on learning the basic asanas and pranayama techniques, and their benefits for physical and mental health. The course also emphasizes the role of Yoga in managing various health conditions, such as stress, anxiety, and chronic diseases.

THE OBJECTIVES

After the completion of this course, the student will be able to:

- 1. Explain the concept of Yoga and its importance in health.
- 2. Describe the various types of Yoga and their benefits.
- 3. Demonstrate the basic asanas and pranayama techniques.
- 4. Apply the knowledge of Yoga in the management of various health conditions.
- 5. Evaluate the role of Yoga in promoting overall health and well-being.

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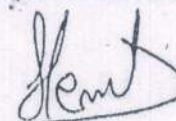
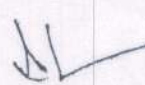
(Dr. Sita. Jay. Chandra)

EVS

Course Title	Environmental Science	Course Code	24DEVS01		
Specialization	Value Added Course	Structure (LTP)	2	0	0
Offered for	D.Voc./Diploma	Status	Core <input checked="" type="checkbox"/>	Elective	
Faculty	SFASH	Type	New <input checked="" type="checkbox"/>	Modification	
Credits	2	Marks	Internal	30	
Hours	30		External	70	
Pre-requisite	Nil	To take effect from	2024-2025		
Submission date	13-07-2024	Date of approval by BoS	23-07-2024		
Course Objective	To create awareness among the students about our ecosystem, related problems and our role in that.				
Course Outcome	<p>On completion of this course, students will be able to:</p> <p>CO1: Understand our environment.</p> <p>CO2: Comprehend ecosystems and biodiversity.</p> <p>CO3: Analyze atmospheric and climate dynamics.</p> <p>CO4: Evaluate urbanization and agricultural practices.</p> <p>CO5: Develop strategies for environmental pollution control.</p>				
Contents of the course	<p>Unit 1: Indian Knowledge System- Indigenous Practices, Understanding our Environment</p> <p>Environment: Definition, Scope and Importance, Natural Resources management: Forest Resources, Water Resources, Mineral Resources, Energy Resources, Food Resources, Land Resources., Traditional agricultural practices - Organic farming, Crop rotation, Intercropping), Water management techniques - Stepwells, Tankas, Baolis, Forest management and conservation methods - Sacred groves, Agroforestry</p> <p>Unit 2: Ecosystem</p> <p>Ecosystem: Introduction, structure, functions & Kinds of ecosystem. Energy flow in ecosystem, Biogeochemical cycles, Habitat and Ecological Niche, Species Interactions, Bio-geographic zones of India.</p> <p>Unit 3: Atmosphere and Environmental Pollution</p> <p>Atmosphere: Introduction, layers of the atmosphere, Climate Change: Greenhouse effect, Global warming, Ozone layer depletion, Deforestation, Air pollution: major air pollutants, classification of air pollutants, impact of air Pollution, controlling measures. Acid Rain.</p> <p>Water Pollution: Introduction, causes, impacts & waste water treatment.</p> <p>Unit 4: Urbanization</p> <p>Urbanization: Introduction, Manifestations of Urbanization, social economic and environmental problems in urbanization, Agriculture: Introduction, unsustainable patterns of modern industrialized agriculture, Green revolution, Soil erosion</p>				

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Field Work	<ul style="list-style-type: none"> • Visit to a local area to document environmental assets river/forest/grassland/hill/mountain • Visit to a local polluted Site-Urban/Rural/Industrial/Agricultural • Participation in plantation drive and nature camps. • Campus environmental management activities such as solid waste disposal, water Management and sanitation, and sewage treatment.
Text Books	<ol style="list-style-type: none"> 1. Singh, J.S., Singh, S.P. & Gupta, S.R. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications. 2. Odum, E.P., Odum, H.T. & Andrews, J. (1971). Fundamentals of Ecology. Philadelphia: Saunders. 3. Gilbert M. Masters and W. P. (2008). An Introduction to Environmental Engineering and Science, Ela Publisher (Pearson).
References	<ol style="list-style-type: none"> 1. Deevdi M. (2021). Environment and ecology in the Indian knowledge system. Vidyanidhi prakashan. 2. Melissa K. Nelson and Daniel Shilling. (2018). Traditional Ecological Knowledge: Learning from Indigenous Practices for Environmental Sustainability. Cambridge University Press. 3. Krishnamurthy, K.V. (2003) Textbook of Biodiversity, Science Publishers, Plymouth, UK. 4. Manahan, S.E. (2022). Environmental Chemistry (11th ed.). CRC Press. 5. Central Pollution Control Board Web page for various pollution standards. https://cpcb.nic.in/standards/ 6. Ahluwalia, V. K. (2015). <i>Environmental Pollution, and Health</i>. The Energy and Resources Institute (TERI).

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Course Title	Applied Mathematics-I	Course Code	24DMTH03		
Specialization	Basic Sciences	Structure (LPC)	3	0	3
Offered for	Diploma	Status	Core	Elective	
Faculty	Skill Faculty of Applied Sciences	Type	New	Modification	
Pre-requisite		To take effect from			
Submission date		Date of approval by BoS			
Course Objective:	The aim of this course is to develop in students an understanding of some of the key mathematical concepts usually taught at the class XI level.				
Course Outcome:	<p>By the end of this course, the student will be able to:</p> <p>CO1. Illustrate the geometric shapes used in engineering problems by Co-ordinate Geometry and Trigonometry.</p> <p>CO2. Formulate engineering problems into mathematical formats with the use matrices, co-ordinate geometry and trigonometry.</p> <p>CO3. Calculate the approximate value of roots of certain expressions in engineering problems by application of binomial theorem.</p> <p>CO4. Explore the idea of location, graph, and linear relationships between two variables.</p> <p>CO5. Discuss the purposes of measures of central tendency and calculate the measures of central tendency (mode, median, mean) for a set of data..</p>				
Contents of the course	<p>Unit 1: Algebra Complex Numbers: definition of complex number, real and imaginary parts of a complex number. Polar and Cartesian Form and their inter conversion, Conjugate of a complex number, modulus and amplitude. Addition subtraction, multiplication and division of complex numbers, Logarithms and its basic properties.</p> <p>Unit 2: Trigonometric Functions Concept of angle, measurement of angle in degrees, grades, radians and their conversions. Trigonometric Ratios of Allied angles, Sum, Difference formulae and Product formulae and their applications Applications of Trigonometric terms in engineering problems such as to find an angle of elevation, height, distance etc.</p> <p>Unit 3: Binomial Theorem, Determinants and Matrices Binomial theorem for positive integral index. First Binomial approximation with application to engineering problems. Determinants and Matrices – Evaluation of determinants (upto 2nd order), Solution of equations (upto 2 unknowns) by Cramer's rule, Definition of Matrices</p>				

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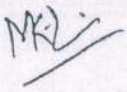
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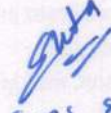
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	<p>and its types, addition, subtraction and multiplication of matrices (upto 2nd order).</p> <p>Unit 4: Statistics Measures of Central Tendency: Mean, Median, Mode Measures of Dispersion: Mean deviation, Standard deviation</p> <p>Unit 5: Co-ordinate Geometry Cartesian and Polar co-ordinates (two dimensional), Distance between two points, mid-point, centroid of vertices of a triangle. Slope of a line, equation of straight line in various standards forms. Intersection of two straight lines, concurrency of lines, angle between straight lines, parallel and perpendicular lines, perpendicular distance formula, conversion of general form of equation to the various forms.</p>
Textbook	<ol style="list-style-type: none"> 1. R. D. Sharma, "Applied Mathematics – I & II for Diploma Courses", Dhanpat Rai Publications. 2. "Mathematics for Class XI", NCERT Publication, New Delhi. 3. "Mathematics for Class XII", NCERT Publication, New Delhi.
References	<ol style="list-style-type: none"> 1. H. K Dass, "Applied Mathematics for Polytechnics", CBS Publishers & Distributors, New Delhi. 2. A Ganesh and G Balasubramanian, "Textbook of Engineering Mathematics – I", CBS Publisher, New Delhi. 3. A Ganesh and G Balasubramanian, "Textbook of Engineering Mathematics – II", CBS Publisher, New Delhi. 4. G. B. Thomas, R. L. Finney, "Calculus and Analytic Geometry", Addison Wesley, Ninth Edition. 5. B S Grewal, "Elementary Engineering Mathematics", Khanna Publishers, Delhi

(Ms. Ekta - Prog. Co-ordinator)

Course Title	Applied Mathematics-II	Course Code	24DMTH04		
Specialization	Basic Sciences	Structure (LPC)	3	0	3
Offered for	Diploma	Status	Core	Elective	
Faculty	Skill Faculty of Applied Sciences	Type	New	Modification	
Pre-requisite		To take effect from			
Submission date		Date of approval by BoS			
Course Objective:	The primary objective of this learning program is to acquire proficiency in beginner-level calculus. Learners will use a variety of tools to solve application problems in engineering and technology.				
Course Outcome:	<p>By the end of this course, the student will be able to:</p> <p>CO1. Formulate the engineering problems into mathematical format with the use of differential equations and differential.</p> <p>CO2. Use the differentiation and Integration in solving various Mathematical and Engineering problems.</p> <p>CO3. Calculate the approximate area under a curve by applying integration and numerical methods.</p> <p>CO4. Learn about basic fundamentals about MATLAB/ SciLab and mathematical calculation with MATLAB/ SciLab software..</p>				
Contents of the course	<p>Unit 1: Limits and Differentiation Concept of limits (Introduction only) and problems related to four standard limits only. Differentiation of sum, product and quotient of functions. Differentiation of trigonometric functions, inverse trigonometric functions. Logarithmic differentiation, successive differentiation (upto 2nd order)</p> <p>Unit 2: Application of differentiation To find the rate measures To find the Maxima and minima.</p> <p>Unit 3: Software MATLAB and SciLab software – Theoretical Introduction. Basic difference between MATLAB and SciLab software. Calculations with MATLAB or SciLab – (a) Representation of matrix (2×2 order) (b) Addition, Subtraction of matrices (2×2 order) in MATLAB or SciLab I Addition and subtraction of values –Trigonometric and Inverse Trigonometric functions</p> <p>Unit 4: Integration Integration as inverse operation of differentiation with simple examples. Simple standard integrals and related problems, Integration by Substitution method and</p>				

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	<p>Integration by parts Evaluation of definite integrals with given limits Unit 5: Application of Integration, Numerical Integration and Differential Equations Applications of integration: for evaluation of area under a curve and axes (Simple problems). Numerical integration by Trapezoidal Rule and Simpson's 1/3rd Rule using pre-existing mathematical models. Definition, order, degree, Type of differential Equations, linearity, Formulation of ordinary differential equation (up to 1st order), solution of ODE (1st order) by variable separation method.</p>
Textbook	<ol style="list-style-type: none"> 1. R. D. Sharma, "Applied Mathematics – I & II for Diploma Courses", Dhanpat Rai Publications. 2. "Mathematics for Class XI", NCERT Publication, New Delhi. 3. "Mathematics for Class XII", NCERT Publication, New Delhi. 4. R. Pratap, "Getting Started with MATLAB 7", Oxford University Press, Seventh Edition
References	<ol style="list-style-type: none"> 1. H. K Dass, "Applied Mathematics for Polytechnics", CBS Publishers & Distributers. 2. A Ganesh and G Balasubramanian, "Textbook of Engineering Mathematics – I", CBS Publisher, New Delhi. 3. A Ganesh and G Balasubramanian, "Textbook of Engineering Mathematics –II", CBS Publisher, New Delhi. 4. G. B. Thomas, R. L. Finney, "Calculus and Analytic Geometry", Addison Wesley, Ninth Edition. 5. B S Grewal, "Elementary Engineering Mathematics", Khanna Publishers, Delhi.


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Applied Physics / Engineering Physics - I							
Diploma (Common for all Branches)							
L	T	P	Credits	Core Course	Internal Examination	:	30
3	0	0	3	24DPHY03	External Examination	:	70
Effective from Session:				2024-25	Total	:	100
Date of BoS approval:				23-07-2024	Duration of Exam	:	3 Hrs
Prerequisite							
Instruction for Paper Setter: <ol style="list-style-type: none"> There should be 11 questions in the End Term examinations question paper. The first (1st) question should be compulsory and cover the entire syllabus. This question should be objective, single line answers or short answer type question of total 20 marks. Apart from question 1 which is compulsory, rest of the paper shall consist of 5 units as per the syllabus. Every unit shall have two questions each of 10 marks each. However, the student shall be asked to attempt only one of the two questions in the unit. Individual questions may contain sub-parts / sub-questions. Each Unit shall have a marks weightage of 14. The questions are to be framed keeping in view the learning outcomes of the course / paper. The standard / level of the questions to be asked should be at the level of the prescribed textbook. The requirement of (scientific) calculators / log-tables / data – tables may be specified if required. 							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Identify and measure physical quantities with accuracy.
- Represent physical quantities, understand the concepts of energy conservation and its applications.
- Acquire scientific skills to solve problems.
- Comprehend matter and environmental effects on it.
- Apply physical principles in different fields.

Course Outcomes:

After completing this subject, student should be able to:

- CO1. Information About Indian knowledge system, describe physical quantities, select their units and make measurements with accuracy.
- CO2. List physical quantities as scalar and vector and identify type of motions, various forms of energy, their conversion and applications.
- CO3. Solve problems related to scientific work, energy and power, norms of friction.
- CO4. Explain properties of matter and effect of temperature on various matter and phenomenon.
- CO5. Demonstrate competency in phenomena of electrostatics and electricity.

Detailed Contents:

UNIT I: Unit and Dimensions

- 1.1 Definition of Physics, physical quantities- fundamental and derived
- 1.2 Units: fundamental and derived
- 1.3 System of units: CGS, FPS, MKS, SI
- 1.4 Dimension, dimensional formulae and SI units of physical quantities-distance, displacement, area, volume, density, velocity, acceleration, linear momentum, force, impulse, work, power, energy, pressure, surface tension, stress, strain)

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- 1.5 Dimensional equations, principle of homogeneity of dimensional equation
- 1.6 Application of dimensional analysis: checking the correctness of physical equation, conversion of system of unit (force, work, acceleration).

UNIT II: Force and Motion


- 2.1 Scalar and vector quantities- definition and examples, representation of vector, types of vector (unit vector, position vector, co-initial vector, collinear vector, co-planar vector)
- 2.2 Vector algebra- addition of vectors, Triangle & Parallelogram law
- 2.3 Scalar and vector product (statement and formula only)
- 2.4 Force and its units, resolution of force
- 2.5 Newton's laws of motion
- 2.6 Linear momentum, Law of conservation of linear momentum, Impulse
- 2.7 Circular motion: definition of angular displacement, angular velocity, angular acceleration, frequency, time period; Relation between linear and angular velocity, centripetal and centrifugal forces, application of centripetal force in banking of road
- 2.8 Rotational motion: definition with examples
- 2.9 Definition of torque, angular momentum, moment of inertia and its physical significance

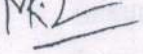

UNIT III: Work, Power and Energy

- 3.1 Work- definition, symbol, formula and SI unit, types of work (zero work, positive work and negative work) with example
- 3.2 Friction- definition and its simple daily life applications.
- 3.3 Power- definition, formula and units
- 3.4 Energy- definition and its SI unit, examples of transformation of energy.
- 3.5 Kinetic energy- definition, examples, formula and its derivation
- 3.6 Potential energy- definition, examples, formula and its derivation
- 3.7 Law of conservation of mechanical energy for freely falling bodies.
- 3.8 Simple numerical problems based on formula of Power and Energy

UNIT IV: Properties of Matter

- 4.1 Elasticity and plasticity- definition, deforming force, restoring force, example of elastic and plastic body
- 4.2 Definition of stress and strain, Hooke's law, modulus of elasticity
- 4.3 Pressure- definition, atmospheric pressure, gauge pressure, absolute pressure, Pascal's law
- 4.4 Surface tension- definition, SI unit, applications of surface tension, effect of temperature on surface tension
- 4.5 Viscosity: definition, unit, examples, effect of temperature on viscosity


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UNIT V: Electrostatics and Electricity

- 5.1 Electric charge, unit of charge, conservation of charge
- 5.2 Coulomb's law of electrostatics
- 5.3 Electric field, electric lines of force, electric field intensity due to a point charge
- 5.4 Definition of electric flux, Gauss law
- 5.5 Capacitor and capacitance
- 5.6 Electric current and its SI Unit, direct and alternating current
- 5.7 Resistance, conductance
- 5.8 Series and parallel combination of resistances
- 5.9 Ohm's law


Text Books:

1. "Text Book of Physics for Class XI (Part-I, Part-II)", N.C.E.R.T., Delhi.
2. "Text Book of Physics for Class XII (Part-I, Part-II)", N.C.E.R.T., Delhi.

Recommended Books:

1. Dr. HH Lal, "Applied Physics, Vol. I and Vol. II", TTTI Publications, Tata McGraw Hill, Delhi.
2. AS Vasudeva, "Applied Physics - I", Modern Publishers, Jalandhar.
3. R A Banwait, "Applied Physics - I", Eagle Prakashan, Jalandhar.
4. E-books/e-tools/relevant software to be used as recommended by AICTE/HSBTE/ NITTTR.
5. C. L. Arora, "Practical Physics", S Chand Publication.


(MS. Ekta Prsg. Co-ordinator)

1. The first part of the report is devoted to a general survey of the work done during the year. It is divided into two main sections: (a) the work done in the laboratory and (b) the work done in the field. The first section is devoted to the study of the properties of the new material and the second section is devoted to the study of the properties of the old material.

2. The second part of the report is devoted to a detailed description of the work done in the laboratory. It is divided into three main sections: (a) the work done in the study of the properties of the new material, (b) the work done in the study of the properties of the old material, and (c) the work done in the study of the properties of the new material.

3. The third part of the report is devoted to a detailed description of the work done in the field. It is divided into three main sections: (a) the work done in the study of the properties of the new material, (b) the work done in the study of the properties of the old material, and (c) the work done in the study of the properties of the new material.

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Applied Physics / Engineering Physics – I Lab						
Diploma (Common for all Branches)						
L	T	P	Credits	Core Course	Internal Examination	: 70
0	0	2	1	24DPHY04	External Examination	: 30
Effective from Session:				2024-25	Total	: 100
Date of BoS approval:				23-07-2024	Duration of Exam	: 3 Hrs

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- to be familiarized with the physical property measuring tools.
- reading values and understanding their parts.
- to read values from the measuring tools.
- to compute physical properties of objects.
- to verify the laws of force.
- to compute atmospheric properties
- to compute force constant, Elastic constant, moment of inertia.
- to apply physical principles in different fields.

Course Outcomes:

After completing this subject, student should be able to:

CO1: Recognize the tool to measure the physical properties of the objects.

CO2: Use tools such as Vernier calliper, screw gauge, spherometer, etc. to measure physical properties of objects.

CO3: Investigate parallelogram law of force, viscosity of liquid, moment of inertia.

CO4: Investigate the force constant, Elastic constants, atmospheric pressure, room temperature, etc.

CO5: Solve problems to convert temperature into different scales, Test ohms' law and laws of resistance.

PRACTICAL EXERCISES

1. Familiarization of measurement instruments and their parts (for example - Vernier calliper, screw gauge, spherometer, travelling microscope etc.), and taking a reading. (compulsory to all students)
2. To find diameter of solid cylinder using a vernier calliper
3. To find internal diameter and depth of a beaker using a vernier calliper and hence find its volume.
4. To find the diameter of wire using screw gauge
5. To find thickness of paper using screw gauge.
6. To determine the thickness of glass strip using a spherometer
7. To determine radius of curvature of a given spherical surface by a spherometer.
8. To verify parallelogram law of force.
9. To determine force constant of spring using Hooke's law

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10. Measuring room temperature with the help of thermometer and its conversion in different scale.

11. Determine the moment of inertia of a flywheel.

12. Find the viscosity of a given liquid (Glycerin) by Stoke's law.

13. Find the elastic constants (Young's modulus, modulus of rigidity, bulk modulus and Poisson's ratio) for the material of a wire by Searle's method.

14. To verify Ohm's laws by plotting a graph between voltage and current.

15. To verify laws of resistances in series combination.

16. To verify laws of resistance in parallel combination.

Note- Experiment may be added as per the curriculum and ability.

Note: Minimum 10 Experiments to be performed

Reference Book:

1. B.Sc. Practical Physics, Geeta Sanon
2. B.Sc. Practical Physics, C. L. Arora
3. NCERT Class XI Practical Physics.
4. NCERT Class XII Practical Physics.

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(Ms. Ekta - Prog. Co-ordinator)

Applied Physics / Engineering Physics - II						
Diploma (Common for all Branches)						
L	T	P	Credits	Core Course	Internal Examination	: 30
3	0	0	3	24DPHY05	External Examination	: 70
Effective from Session:				2024-25	Total	: 100
Date of BoS approval:				23-07-2024	Duration of Exam	: 3 Hrs
Prerequisite						
Instruction for Paper Setter: <ol style="list-style-type: none"> There should be 11 questions in the End Term examinations question paper. The first (1st) question should be compulsory and cover the entire syllabus. This question should be objective, single line answers or short answer type question of total 20 marks. Apart from question 1 which is compulsory, rest of the paper shall consist of 5 units as per the syllabus. Every unit shall have two questions each of 10 marks each. However, the student shall be asked to attempt only one of the two questions in the unit. Individual questions may contain sub-parts / sub-questions. Each Unit shall have a marks weightage of 14. The questions are to be framed keeping in view the learning outcomes of the course / paper. The standard / level of the questions to be asked should be at the level of the prescribed textbook. The requirement of (scientific) calculators / log-tables / data – tables may be specified if required. 						

Course Objectives:

The course aims to inculcate skills among students with following objectives

- Understanding different types of wave forms.
- Learn laws of reflection and refraction of light.
- Demonstrating electrostatics and electricity phenomena.
- Categorizing properties of materials and create new materials.
- Apply knowledge of Modern Physics for different technical applications.

Course Outcomes

At the end of this course, the students will be able to:

- CO1: Differentiate between types of waves and their motion.
 CO2: State laws of reflection and refraction of light.
 CO3: Demonstrate competency in phenomena of electrostatics and electricity.
 CO4: Classify properties of material to prepare new materials for various technical applications.
 CO5: Demonstrate a strong foundation on Modern Physics to use at various Technical applications.

Detailed Contents:

UNIT I: Wave Motion and Its Applications

- 1.1 Waves: definition, types (mechanical and electromagnetic wave)
- 1.2 Wave motion- transverse and longitudinal with examples, terms used in wave motion like displacement, amplitude, time period, frequency, wavelength, wave velocity; relationship among wave velocity, frequency and wave length
- 1.3 Simple harmonic motion (SHM): definition, examples
- 1.4 Cantilever: definition, formula of time period
- 1.5 Free, forced and resonant vibrations with examples
- 1.6 Sound waves: types (infrasonic, audible, ultrasonic) on the basis of frequency, noise, coefficient of absorption of sound, echo

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UNIT II: Optics

- 2.1 Reflection and refraction of light with laws, refractive index
- 2.2 Lens: introduction, lens formulae (no derivation), power of lens and simple numerical problems
- 2.3 Total internal reflection and its applications, critical angle and conditions for total internal reflection
- 2.4 Superposition of waves, definition of Interference, Diffraction and Polarization of waves
- 2.5 Introduction to Microscope, Telescope and their applications

UNIT III: Electrostatics and Electricity

- 3.1 Electric charge, unit of charge, conservation of charge
- 3.2 Coulomb's law of electrostatics
- 3.3 Electric field, electric lines of force (definition and properties), electric field intensity due to a point charge
- 3.4 Definition of electric flux, Gauss law
- 3.5 Capacitor and capacitance
- 3.6 Electric current and its SI Unit, direct and alternating current
- 3.7 Resistance, conductance
- 3.8 Series and parallel combination of resistances
- 3.9 Ohm's law

UNIT IV: Classification of Materials and their Properties

- 4.1 Definition of energy level, energy bands.
- 4.2 Types of materials (conductors, Semiconductors, insulators, and dielectric)
With example, intrinsic and extrinsic semiconductors with examples.
- 4.3 Introduction to magnetism, type of magnetic materials: diamagnetic,
- 4.4 paramagnetic and ferromagnetic materials with examples
- 4.5 Magnetic field, magnetic lines of force, magnetic flux
- 4.6 Electromagnetic induction

UNIT V

Modern Physics

- 5.1 Laser: introduction, principle, absorption, spontaneous emission, stimulated emission, population inversion
- 5.2 Engineering and medical applications of laser
- 5.3 Fibre optics: introduction to optical fibers, light propagation, fiber type, applications in medical, telecommunication and sensors
- 5.4 Nanotechnology: introduction, definition of Nano materials with examples, properties at nanoscale, applications of nanotechnology.

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(Mrs. Ekta - Prog. Co-ordinator)

Text Books:

1. "Text Book of Physics for Class XII (Part-I, Part-II)", N.C.E.R.T., Delhi.
2. Dr. HH Lal, "Applied Physics, Vol. I & II", TTTI Publications, Tata McGraw Hill, Delhi.
3. AS Vasudeva, "Applied Physics - II", Modern Publishers, Jalandhar.
4. R A Banwait, "Applied Physics - II", Eagle Prakashan, Jalandhar.
5. N Subrahmanyam, Brij Lal and Avadhanulu, "A text book of OPTICS", S Chand Publishing, New Delhi. E-books/e-tools/relevant software to be used as recommended by AICTE/ HSBTE/NITTTR.
6. M H Fulekar, "Nanotechnology: Importance and Applications", IK International Publishing House (P) Ltd., New Delhi.
7. C. L. Arora, "Practical Physics", S Chand Publication.

Recommended Books:

1. Dr. HH Lal, "Applied Physics, Vol. I and Vol. II", TTTI Publications, Tata McGraw Hill, Delhi.
2. AS Vasudeva, "Applied Physics - I", Modern Publishers, Jalandhar.
3. R A Banwait, "Applied Physics - I", Eagle Prakashan, Jalandhar.
4. E-books/e-tools/relevant software to be used as recommended by AICTE/HSBTE/ NITTTR.
5. C. L. Arora, "Practical Physics", S Chand Publication.

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(ms. Ekta - Prog. Co-ordinator)

Applied Physics / Engineering Physics – II Lab							
Diploma (Common for all Branches)							
L	T	P	Credits	Core Course	Internal Examination	:	70
0	0	2	1	24PHY06	External Examination	:	30
Effective from Session:				2024-25	Total	:	100
Date of BoS approval:				23-07-2024	Duration of Exam	:	3 Hrs

COURSE OBJECTIVES

The course aims to inculcate skills among students with following objectives

- Identifying different types of apparatus/ instruments for measuring properties.
- Analyzing time and time variations of varying different objects.
- Demonstrating electrostatics and electricity phenomena.
- Plot voltage, current and study colour coding scheme of resistance.
- Verify different laws and phenomena of physics:

COURSE LEARNING OUTCOMES

At the end of this course, the students will be able to:

- CO1: Identify the apparatus to be used and understand their components.
 CO2: Analyse time variations of pendulum and cantilever.
 CO3: Test laws of reflection, refraction, ohms law and laws of resistance.
 CO4: Examine physical properties of objects.
 CO5: Examine focal length of concave and convex lens.

PRACTICAL EXERCISES

1. Familiarization with apparatus (resistor, rheostat, key, ammeter, voltmeter, telescope, microscope etc.)
2. To find the time period of a simple pendulum.
3. To study variation of time period of a simple pendulum with change in length of pendulum.
4. To determine and verify the time period of Cantilever.
5. To verify Ohm's laws by plotting a graph between voltage and current.
6. To study colour coding scheme of resistance.
7. To verify laws of resistances in series combination.
8. To verify laws of resistance in parallel combination.
9. To find resistance of galvanometer by half deflection method.
10. To verify laws of reflection of light using mirror.
11. To verify laws of refraction using glass slab.
12. To find the focal length of a concave lens, using a convex lens.

Note- Experiment may be added as per the curriculum and ability.

Note: Minimum 8 Experiments to be performed

Reference Book:

1. B.Sc. Practical Physics, Geeta Sanon
2. B.Sc. Practical Physics, C. L. Arora
3. NCERT Class XI Practical Physics.
4. NCERT Class XII Practical Physics.

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 (M.S. Electa- Prog. Co-ordinator)

Course Title	Applied Chemistry	Course No. :	24DCHM03 (Theory) 24DCHM04 (Lab)		
Specialization	Basic Sciences	Structure (LTP)	3	0	1
Offered for	Diploma	Status	Core <input checked="" type="checkbox"/>	Elective	
Faculty	SFASH	Type	New <input checked="" type="checkbox"/>	Modification	
Pre-requisite	Nil	To take effect from	2024-2025		
Submission date		Date of approval by BoS	23-07-2024		
Course Objective:	There are numerous number materials are used in fabricating and manufacturing devices for the comfort of life. The selection, characterization and suitability assessment of natural raw materials essentially requires principles and concepts of Applied Chemistry for technicians. On successful completion of this course content will enable technicians to understand, ascertain and analyse and properties of natural raw materials require for producing economical and eco-friendly finished products.				
Course Outcome:	<p>By the end of this course, the student will be able to:</p> <p>CO1: Solve various engineering problems applying the basic knowledge of atomic structure and chemical bonding.</p> <p>CO2: Use relevant water treatment method to solve domestic and industrial problems.</p> <p>CO3: Solve the engineering problems using knowledge of engineering materials and properties.</p> <p>CO4: Use relevant fuel and lubricants for domestic and industrial applications.</p> <p>CO5: Solve the engineering problems using concept of Electrochemistry and Corrosion.</p>				
Contents of the course	<p>Unit 1: Atomic Structure</p> <p>Atomic Structure: Rutherford model of atom, Bohr's theory (qualitative treatment only), Heisenberg uncertainty principle, Quantum numbers – orbital concept, Shapes of s, p and d orbitals, Pauli's exclusion principle, Hund's rule of maximum multiplicity, Aufbau rule, electronic configuration.</p> <p>Unit 2: Chemical Bonding and Water Chemistry</p> <p>Concept of chemical bonding, cause of chemical bonding, types of bonds: ionic bonding (NaCl example), covalent bond (H₂, F₂, H₂O), coordination bond in NH₄⁺, metallic bonding.</p> <p>Classification of soft and hard water, salts causing water hardness, unit of hardness. Cause of poor lathering of soap in hard water, problems caused by the use of hard water in boiler (scale and sludge, foaming and priming, corrosion etc), and quantitative measurement of water hardness by EDTA method, total dissolved solids (TDS). Water softening techniques-soda lime process, zeolite process and ion exchange process.</p>				

From SFASH
E146

(Ms. E146 - Prog. Co-ordinator)

Hirani

M.K.

JL

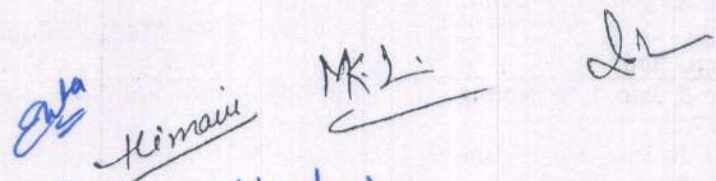
	<p>Unit 3: Chemistry of Fuels</p> <p>Definition of fuel and combustion of fuel, classification of fuels, calorific values (HCV and LCV), Proximate analysis of coal. Petrol and diesel - fuel rating (octane and cetane numbers), Chemical composition, calorific values and applications of LPG, CNG, water gas, coal gas, producer gas and biogas.</p> <p>Unit 4: Lubricants and Lubrication</p> <p>Lubrication—function and characteristic properties of good lubricant, classification with examples, lubrication mechanism – hydrodynamic and boundary lubrication, physical properties (viscosity and viscosity index, oiliness, flash and fire point, cloud and pour point only) and chemical properties (coke number, total acid number saponification value) of lubricants.</p> <p>Unit 5: Corrosion Chemistry</p> <p>Introduction to Corrosion of metals, types and mechanism of corrosion (chemical and electrochemical), H₂ liberation and O₂ absorption mechanism of electrochemical corrosion, Forms of corrosion, factors affecting rate of corrosion. Preventive measures of corrosion.</p>
Textbook	<ol style="list-style-type: none"> 1. Text Book of Chemistry for Class XI & XII (Part-I, Part-II); N.C.E.R.T., Delhi, 2017- 18. 2. Agarwal, & Shikha, Engineering Chemistry, Cambridge University Press; New Delhi, 2015. 3. Engineering Chemistry-I concept and application by Jit Chakraborty, Asimesh Dutta Gupta, Ravikanth Kamlekar 4. Agnihotri, Rajesh, Chemistry for Engineers, Wiley India Pvt. Ltd., 2014. 5. Dara, S. S. & Dr. S.S. Umare, Engineering Chemistry, S. Chand. Publication, New Delhi, New Delhi, 2015. 6. Engineering Practical Chemistry by Dr. Bindu Mangla, Rajni Sachdeva Beena Sethi
References	<ol style="list-style-type: none"> 1. Jain & Jain, Engineering Chemistry, Dhanpat Rai and Sons; New Delhi, 2015. 2. C.N. R. Rao, Understanding Chemistry, Universities Press (India) Pvt. Ltd., 2011. 3. Dr. Vairam, S., Engineering Chemistry, Wiley India Pvt. Ltd., New Delhi, 2013. 4. Dr. G. H. Hugar & Prof A. N. Pathak, Applied Chemistry Laboratory Practices, Vol. I and Vol. II NITTTR, Chandigarh, Publications. 5. Text Book of Chemistry for Class XI & XII (Part-I, Part-II); N.C.E.R.T., Delhi. 6. Dr. G. H. Hugar and Prof A. N. Pathak, Applied Chemistry Laboratory Practices, Vol. I and Vol. II, NITTTR, Chandigarh, Publications, 2013-14. 7. Agnihotri, Rajesh, Chemistry for Engineers, Wiley India Pvt. Ltd., 2014. 8. Jain & Jain, Engineering Chemistry, Dhanpat Rai and Sons; New Delhi, 2015. 9. Practical Chemistry by S.S. Dara 10. Practical Chemistry by D N Bajpai – S. Chand Publishing 11. Advanced Practical Chemistry Book by pragati prakash





 (MS. Ekta - Prog. Co-ordinator)

Laboratory Content	<u>List of Experiments</u>
	<ol style="list-style-type: none"> 1. To determine the viscosity and relative viscosity of given sample by using Ostwald's Viscometer. 2. Volumetric estimation of total hardness of given water sample using standard EDTA solution. 3. Estimation of total alkalinity of water volumetrically. 4. To calculate Biochemical Oxygen Demand (BOD) of the given water sample. 5. To calculate Total Dissolved Solids (TDS) present in the given water sample. 6. To determine the inorganic nitrogen (Nitrate Nitrogen) in the given water sample. 7. To calculate the Total Kjeldahl Nitrogen in the given water sample. 8. Proximate analysis of coal: Gravimetric estimation of moisture in given coal sample. 9. Determine the pH of given sample using pH meter 10. Determination of calorific value of solid or liquid fuel using bomb calorimeter. 11. Detection of metal iron in the rust (solution of rust in concentrated HCl may be given). 12. Synthesis of a polymer Urea Formaldehyde resin/Phenol Formaldehyde resin. 13. Determination of surface tension. 14. Determination of residual chloride content of water 15. Estimation of Dissolved Oxygen, Dissolved Carbon Dioxide.
	<p>Note: Minimum 6-8 Experiments to be performed</p>



 (Ms. Ekta - Prog. Co-ordinator)

24DGEN05: Fundamentals of IT							
Diploma in Computer Engineering							
Semester – I							
L	T	P	Credits	Core Course	Internal Examination	:	30
3	0	0	3		External Examination	:	70
Effective from Session:				w.e.f. 2024-2025	Total	:	100
Date of BoS approval:				23-07-24	Duration of Exam	:	3 Hrs
Prerequisite							

Course Objectives:

The course aims to inculcate skills among students with following objectives:

- Acquire the basic knowledge of computer system, internet and WWW.
- Handling of input/ output devices and installing Operating System.
- Connecting and configuring external devices to the computer.
- Use MS office applications for different jobs.
- Work with spreadsheets and prepare presentations.

Course Outcomes:

At the end of the course student will be able to

CO1: Explain the basic components of Computers, Internet and issues of abuses/ attacks on information and computers.

CO2: Describe handling of the Computer / Laptop / Mobiles / Internet Utilities and Install/Configure OS.

CO3: List steps to assemble a PC and connect it to external devices.

CO4: Explain features of Office practiced Automation Tools.

CO5: Understand Office tools to develop worksheets and Prepare presentations.

Detailed Contents:

UNIT I: Basics of Computer

- 1.1 Brief history of development of computers
- 1.2 Definition of Computer, Block diagram of a Computer, Hardware, Software,
- 1.3 Booting: Cold and Hot Booting
- 1.4 Interaction between the CPU and Memory with Input / Output devices
- 1.5 Function of CPU and major functional parts of CPU.
- 1.6 Memory, Bit, Nibble, Byte, KB, MB, GB, TB, PB, Functions of memory
- 1.7 use of storage devices in a Computer, List types of memory used in a Computer, Importance of cache memory, CPU speed and CPU word length.

UNIT II: Basic Internet Skills

- 2.1 Understanding browser, Introduction to WWW, efficient use of search engines, awareness about Digital India portals (state and national portals) and college portals.
- 2.2 Advantages of Email, Various email service providers, Creation of email id, sending and receiving emails, attaching documents with email and drive.
- 2.3 Effective use of Gmail, G-Drive, Google Calendar, Google Sites, Google Sheets, Online mode of communication using Google Meet & WebEx.

Unit III: Basic Logic building

- 3.1 Introduction to Programming
- 3.2 Steps involved in problem solving
- 3.3 Definition of Algorithm, Definition of Flowchart, Steps involved in algorithm development, differentiate algorithm

and flowchart, symbols used in flowcharts, algorithms for simple problems, flowcharts for simple problems,

3.4 Practice logic building using flowchart/algorithms

Unit IV: Office Tools

- 4.1 Importance, methods and procedure of data entry
- 4.2 Office Tools like MSOffice.
- 4.3 MS Word-Typesetting Text and Basic Formatting ,Inserting Images, Hyperlinks, Bookmarks, Tables and Table Properties in Writer
- 4.4 MS Excel :Working with Cells, Sheets, data, tables, using formulae and functions, using charts and graphics.
- 4.5 MS Power Point – Creating and Viewing Presentations, Inserting Pictures and Tables, Slide Master and Slide Design, Custom Animation.

Unit V: Social Media and Digital Marketing

- 5.1 Introduction to Digital Marketing – Why Digital Marketing, Characteristics of Digital Marketing, Tools for Digital Marketing
- 5.2 Effective use of Social Media like LinkedIn, Google+, Facebook, Twitter, etc.
- 5.3 Features of Social media, Advantages and Disadvantages of Social Media.

Text Books:

- 1. R.S. Salaria, "Computer Fundamentals" Khanna Publishing House
- 2. Ramesh Bangia, "PC Software Made Easy – The PC Course Kit" Khanna Publishing House

RECOMMENDED BOOKS

- 1. Online Resources, Linux man pages, Wikipedia
- 2. Mastering Linux Shell Scripting: A practical guide to Linux command-line, Bash scripting, and Shell programming, by Mokhtar Ebrahim, Andrew Mallett, Vikas Gupta, "Comdex Hardware and Networking Course Kit" Dream Tech press, New Delhi, 2008
- 3. Sumitabha Das, "UNIX concepts and applications" Tata McGraw Hill, New Delhi, 4th Edition, 2008

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(MS-Excel - Prog. Prog. Co-ordinator)

24DGEN06: Fundamentals of IT Lab							
Diploma in Computer Engineering							
Semester – I							
L	T	P	Credits	Core Course	Internal Examination	:	70
0	0	2	1		External Examination	:	30
Effective from Session:				w.e.f. 2024-2025	Total	:	100
Date of BoS approval:				23-07-24			
Prerequisite							

Course Objectives:

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- Connecting and configuring external devices to the computer.
- Use MS office applications for different jobs.
- Work with spreadsheets and prepare presentations.

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- CO1: Explain the basic components of Computers, Internet and issues of abuses/ attacks on information and computers.
- CO2: Execute handling of the Computer / Laptop / Mobiles / Internet Utilities and Install/Configure OS.
- CO3: Assemble a PC and connect it to external devices.
- CO4: Use and Manage Office practiced Automation Tools.
- CO5: Apply knowledge of Office tools to develop worksheets and Prepare presentations.

Practical Exercises:

1. Browser features, browsing, using various search engines, writing search queries
2. Visit various e-governance/Digital India portals, understand their features, services offered.
3. Read Wikipedia pages on computer hardware components, look at those components in lab, identify them, recognize various ports/interfaces and related cables, etc.
4. Using Administrative Tools/Control Panel Settings of Operating Systems
5. Connect various peripherals (printer, scanner, etc.) to computer, explore various features of peripheral and their device driver software.
6. Explore features of Open Office tools and MS-Office, create documents, create presentation, create spreadsheet, using these features, do it multiple times
7. Working with Conversion Software like pdf To Word, Word To PPT, etc.
8. Working with Mobile Applications – Searching for Authentic Mobile app, Installation and Settings, Govt. of India Mobile Applications
9. Creating email id, sending and receiving mails with attachments.
10. Using Google drive, Google calendar

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(MS.EITA - Prog. Co-ordinator)

