Integral University, Lucknow

Department of Mechanical (Automobile) Engineering

Study and Evaluation Scheme

Program: Diploma in Engineering

Semester I

S. No.	Course code	Course Title	Type of Paper	Period Per hr/week/sem			Evaluation Scheme				Sub. Total	Credit	Total Credits	Attributes						
				L	T	P	CT	TA	Total	ESE				Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics
THEORIES																				
1	DMA-101	Applied Mathametics-1(A)	Core	03	01	00	40	20	60	40	100	3:1:0	4	√	√	√				
2	DPH-101	Applied Physics (A)	Core	03	01	00	40	20	60	40	100	3:1:0	4	√	√	√		√		
3	DCH-101	Applied Chemistry (A)	Core	03	01	00	40	20	60	40	100	3:1:0	4	√	√	√		√		
4	DPC-101	Professional Communication	Core	03	01	00	40	20	60	40	100	3:1:0	4	√	√	√			√	√
5	DAM-101	Applied Mechanics (A)	Core	03	01	00	40	20	60	40	100	3:1:0	4	√	√	√				
6	DWS-101	Elementary Workshop Technology	Core	03	01	00	40	20	60	40	100	3:1:0	4	√	√	√		√		
PRACTICAL																				
7	DPH-151	Applied Physics Lab	Core	00	00	02	40	20	60	40	100	0:0:1	1	√	√	√		√		
8	DWS-151	Workshop Practice	Core	00	00	03	40	20	60	40	100	0:0:1.5	1.5	√	√	√		√		
9	DAM-151	Applied Mechanics Lab	Core	00	00	02	40	20	60	40	100	0:0:1	1			√				
10	DPC-151	Professional Communication Lab	Core	00	00	02	40	20	60	40	100	0:0:1	1	√	√	√		√	√	√
11	GP-151	General Proficiency		_	_	_	_	_	60	_	60								√	√
Total				18	06	09	_	_	_	_	1060		**28.5**							

APPLIED MATHEMATICS-I (A) (DMA-101)

(Common to All Diploma Engineering Courses)

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UNIT-1 **[9]**

Series:

Arithmetical Progression**:** n^{th} term of AP, Sum of **'n'** terms, Arithmetic Mean.

Geometrical Progression**:** n^{th} term of GP, Sum of **'n'** terms& infinite terms, Geometric Mean.

Binomial theorem:

Definition of factorial notation, permutation and combination, Binomial theorem for positive index, negative and fractional index(without proof), Application of Binomial theorem.

Determinants:

Definition, expansion and elementary properties of determinant of order 2 and 3. Solution of system of linear equations, Consistency of equations, Cramer's rules.

UNIT-2 [8]

Trigonometry:

Trigonometric functions of allied, compound, multiple and submultiple angles.Trigonometric identities.Sine, Cosine, Projection and Tangent rules.

Hyperbolic and Inverse circular functions.

UNIT-3 [7]

Complex Number:

Definition of imaginary number, complex number & its conjugate.Algebra of complex number (equality, addition, subtraction, multiplication and division).Geometrical representation of a complex number, modulus and amplitude.Polar form of a complex number, Square root of a complex number.De Moivre's theorem (without proof)& its application.

UNIT-4 **[8]**

Coordinate Geometry:

Standard from of curves.

Parabola: $x^2 = 4ay,\ y^2 = 4ax$

Ellipse: $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, Hyperbola: $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

Distance between two points in space, direction cosine and direction ratio.

UNIT-5 **[8]**

Plane and Sphere:

Finding equation of straight line and shortest distance between two lines, Equation of a plane, Relation between lines and planes, Sphere.

References:

1. Applied Mathematics: Kailash Sinha, Meerut publication.
2. Applied Mathematics: P.K Gupta, Asian Publication.
3. Applied Mathematics: H.R Luthra, Bharat Bharti publication.
4. Applied Mathematics: H.K Das, C.B.S Publication.
5. Mathematics for Polytechnic: S.P Deshpande, Pune Vidyarthi Grih

APPLIED PHYSICS-(A)

(DPH-101)

[COMMON TO ALL DIPLOMA ENGINEERING COURSES]

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UNIT-1

Measurement:
Units and Dimensions [6]
Fundamental and derived units:
S.I. Units and Dimensions of physical quantities, Dimensional formula and dimensional equation, Principal of homogeneity and application of homogeneity principle to:
(i) Checking the correctness of physical equations
(ii) Deriving relations among various physical quantitions,
(iii) Conversion of numerical values of physical quantities form one system of units into another, Limitations of dimensional analysis, Errors in measurement, accuracy and precision, random and systematic errors, estimation of probable errors in the result of measurement (combination of errors in addition, subtraction, multiplication and power). Significant figures and order of accuracy in respect to instruments.

Vector:
Scaler and vector quantities; Addition, Subtraction, Resolution of vector; Cartesian components of vector, Scaler and vector product of vectors.

UNIT-II [10]

Force and Motions:
Newton's Law of Motion, Circular motion, angular velocity, angular acceleration and centripetal acceleration. Relationship between linear velocity and angular velocity, Relationship between linear acceleration and angular acceleration.

Fluid mechanics and fiction:
Surface tension, capillaries, equation of continuity, Bernoulli's theorem, stream line and turbulent flow, Reynold's number. Physical significance of friction, Advantage and disadvantage of friction and its role in every day life, Static and dynamic frictional forces, Coefficients of static and dynamic frictions and their measurement, Viscosity, Coefficients of viscosity and its determination by Stoke's method.

Work, Power and Energy:

Work done by force on bodies moving on horizontal and inclined planes in presence of frictional forces, Concept of power and its units, Calculation of power (simple cases). Concept of kinetic and potential energy, various forms of energy, conservation of energy, Force constant of spring, Potential energy of stretched spring.

Unit-III **[8]**

Elasticity:
Elasticity, Stress and Strain, Hooke's law, Elastic limit, Yielding point and breaking point, Modulus of elasticity, Young's modulus, Bulk modulus and modulus of rigidity, Poisson ratio, Resilience.
Simple Harmonic Motion, Periodic Motion, Characteristics of Simple Harmonic Motion, Equation of Simple Harmonic Motion and determination of Velocity and acceleration, Graphical representation, Spring Mass system, Simple pendulum, Derivation of their periodic time, Energy conservation in Simple Harmonic Motion, Definition of free, Forced, undamped and damped vibrations, Resonance and its sharpness, Q-factor.

Unit-IV **[8]**

Gas laws and specific heats of gases:
Boyle's law, Charle's law, Gay Lussac's law, Absolute temperature, Kelvin scale of temperature, General gas equation(without derivation), Molar or universal gas constant, Universal gas equation, Standard or normal temperature and pressure (N.T.P), Specific heat of gases, Relation between two specific heat, Thermodynamics variables, first law of thermodynamics(statement and equation only), Isothermal, Isobaric, Isochoric and adiabatic processes (Difference among these processes and equation of state).

Unit-V **[8]**

Heat transfer and radiation:
Modes of heat transfer, Coefficient of thermal conductivity and its determination by
(i) Searle's Method for good conductors.
(ii) Lee's Method for poor conductors.
Conduction of heat through compound media, Conduction and convection, Radial flow of heat, Blackbody radiation, Stefan's law, Wein's displacement and Rayleigh- Jeans laws, Planck's law.

References:

1. Nootan Physics: Kumar & Mittal
2. Applied Physics: P.K. Gupta.
3. Pradeep Fundamental: Gogia & Gomber.
4. Applied Physics: P.S. Kushwaha.

DCH-101	Applied Chemistry (A)				
Pre-requisite	**Co-Requisite**	**L**	**T**	**P**	**C**
None	**None**	**03**	**01**	**00**	**--**
Objective	To know the basic concept of Chemistry and their Applications in Engineering				
UNIT I	**Atomic Structure and Classification of Elements:**				08
Basic concept of atomic structure, Matter wave concept, Quantum number, Heisenberg's uncertainty principle, Shapes of orbitals. Modern classification of elements (s, p, d, and f block elements), periodic properties: ionization potential, electro negativity, electron affinity.					
UNIT II	**Chemical Bonding:**				07
Overview of basic concept of Ionic, Covalent & Co-ordinate bonds, Hydrogen bonding, Valence bond theory, Hybridization, VSEPR theory, Molecular orbital theory.					
UNIT III	**Electrochemistry-I and Electrochemistry-II:**				08
Arrhenius theory of electrolytic dissociation, Transport number, Electrolytic conductance, Ostwald dilution law. Concept of acid and bases: Arrhenius, Bronsted and Lewis theory. Concept of pH and numericals. Buffer solutions, Indicators, Solubility product, Common ion effect with their application. Redox reactions, electrode potential (Nernst equation), Electro-chemical cell (Galvanic and Electrolytic). EMF of a cell and free energy change. Standard electrode potential, Electrochemical series and its application. Chemical and electrochemical theory of corrosion, Galvenic Series. Prevention of corrosion by various methods.					
UNIT IV	**Chemical Kinetics, Catalysis and Solid State:**				09
Introduction, Law of mass action, order and molecularity of reaction. Activation energy, rate constants, 1st order reactions and 2nd order reactions. Definition, Characteristics of catalytic reactions, Catalytic promoters and poison, autocatalysis and negative catalysis. Theory of catalysis and applications. Types of solids (Amorphous and Crystalline), classification (Molecular, Ionic, Covalent and Metallic), Band theory of solids (Conductors, Semiconductors and Insulators), types of crystals, FCC, BCC, Crystal imperfection.					

UNIT V	**Water Treatment:**	08
Hardness of water, its limits and determination of hardness of water by EDTA method. Softening methods (Only Soda lime, Zeolite and Ion exchange resin process). Disadvantages of hard water in different industries, scale and sludge formation, corrosion, caustic embrittlement, priming and foaming in boilers. Disinfection of Water by chloramine-T, Ozone and chlorine. Advantages and disadvantages of chlorination. Industrial waste and sewage, Municipality waste water treatment, Definition of BOD and COD. Numerical problems based on topics.		
Reference books:	1. Applied Chemistry: R. S. Katiyar and J. P. Chaudhary 2. Applied Chemistry: Rakesh Kapoor 3. Principles of general and inorganic chemistry: O. P. Tandon 4. Engineering Chemistry: S. Chandra 5. Applied Chemistry: M. Gupta	

PROFESSIONAL COMMUNICATION
(DPC-101)
[Common to All Engineering Courses]

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UNIT-I

Communication in English:

Concept of communication, importance of effective communication, types of communication, formal and informal, verbal and nonverbal, spoken and written, Techniques of communication, Listening and reading, writing and speaking, Barriers to communication- Modern tools of communication-

Fax, e-mail, Telephone, telegram, etc., Techniques for clear, concise, correct and coherent writing, Difference between technical writing and general writing. 5 **UNIT-II**

Letters:

Kinds of letters: Official, demi-offical, unofficial, enquiry letter, quotation, tender and order giving letters. Application for a job, Resume, complaint letter and adjustment letter. 5

Report writing, Note making and minutes writing.

UNIT-III

Grammar:

Transformation of sentences, synthesis, Preposition, Articles, Idioms and Phrases, One word substitution, Abbreviations. Tenses, Active and Passive voice. 15

Composition on narrative, descriptive, imaginative, argumentative, discussion and factual topics.

UNIT-IV

Spoken English:

Phonemes (Speech sound), Consonant sounds, vowels sounds and dipthongs, Phonetic transcription, IPA, word stress and Intonation. 10

Development of comprehension and knowledge of English through the study of text material and language exercises based on the prescribed text book of English.

UNIT-V.

Letter writing in Hindi:

Kinds of letters: Official, demi-offical, unofficial, enquiry letter, quotation, tender and order giving letters, Application for a job. 5

References:

1. Dr. R.P. Chauhan, : Asian Publishers, Muzaffarnagar.
2. S.V. Singh & M. S. Verma : Bharat Bharat Prakashan, Meerut.
3. R. Thakur & M . Singh, Meerut Publication.

APPLIED MECHANICS-(A)
(DAM-101)

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UNIT-1

Introduction:

Mechanics and its utility. Concept of scalar and vector quantities. Effect of a force. Tension & compression. Rigid body. Principle of physical independence of force. Principle of transmissibility of a force. 7

UNIT-II

System of Forces:

Concept of coplaner and non-coplaner forces including parallel forces. Concurrent and non-concurrent forces. Resultant force. Equilibrium of forces. Law of parallelogram of forces. Law of triangle of forces and its converse. Law of polygon of forces. Solution of simple engineering Problems by analytical and graphical methods such as simple wall crane, jib crane and other structures. Determination of resultant of any number of forces in one plane acting upon a particle, conditions of equilibrium of coplaner concurrent force system.. 9

UNIT-III

Moment & Couple:

Concept of Varignon's theorem. Generalized theorem of moments. Application to simple problems on levers-Bell crank lever, compound lever, steel yard, beams and wheels, lever safety valve, wireless mast, moment of a couple; Properties of a couple ; Simple applied problems such as pulley and shaft. 7

UNIT-IV

General Condition of Equilibrium:

General condition of equilibrium of a rigid body under the action of coplaner forces, statement of force law of equilibrium, moment law of equilibrium, application of above on body. 7

UNIT-V

Friction:

Types of friction: statical, limiting and dynamical friction, statement of laws of sliding friction, Coefficient of friction, angle of friction; problems on eqilibrium of a body resting on a rough inclined plane, simple problems on friction. Conditions of sliding and toppling. 10

References:

1. Applied Mechanics & Strength of Material: R.S. Khurmi , S.Chand Publication
2. Applied Mechanics : Hemendra Dutt Gupta, Navbharat Publication

ELEMENTARY WORKSHOP TECHNOLOGY
(DWS-101)

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UNIT-1

General Introduction:

Scope of subject "Workshop Technology" in engineering. (Different shop activities and broad division of the shops on the basis of nature of work done such as Wooden Fabrication (Carpentry) Metal Fabrication (shaping and Forming, Smithy, Sheet metal and Joining-welding, Rivetting, Fitting and Plumbing.

Carpentary :

Fundamental of wood working operations:

- Marking & Measuring.
- Holding & Supporting.
- Cutting & Sawing.
- Drilling & Boring.
- Turning.
- Jointing.

Common Carpentry Tools:

Their classification, size, specification (name of the parts and use only).

Marking and measuring tools:

Rules, try square, Bevel Square, Marking gauge, Mortisegauge, Scriber (marking knife).

Combination set Holding and supporting Tools:

Carpentary vice, Bench hold fast, Bar clamp, Bench hook, Hand clamp C and G clamp.

Cutting and Sawing Tools:

Saws: (Grip or Hand, panel, cross cut, Tenon, dove tail, compass, key hole and bow saw),

Chisel: (Firmer, dovetail, mortise and gauge),

Planes: (Wooden & Iron plane. Jack plane, Smoothing plane).

Drilling and Boring tools: Auger, Gimlet, Hand drill, Brace and bits.

Striking Tools: Mallet and Claw hammer.

Turning Tools & Equipments: Wood working lathe and lathe tools.

Miscellaneous Tools: Screw driver, Rasp, Pincer, Oil stone, Triangular file and Saw set.

Joining of Timber Components for Fabrication Works:

Assembly of joints (Preparation steps and tools used only) Mortise, Tenon, Rivet , Groove, Tongue, Dowel, operations in assembly-Simple lap and butt, Mortise, Tenon, Dovetail, Mitre & briddle joints. Uses of glue,

dowelpin and screw in preparation of joints. Common defects likely to occur during and after joining, defects due to wrong use of tools, defects due to wrong operation, defects due to improper seasoning of timbertheir identification and remedy. Safety (personal and equipment) to be observed. 8

UNIT-II

Metal Fabriation:

Metal Shaping:

Smithy: Operations involved (concept only)-Preparation of fire, Supporting and holding the metal, cutting the metal in size, heating, drawing down or fullering, usetting, swaging, bending, punching, blanking, drifting and forge welding, Tools and equipment used (Names, size, specification for identification only).

Heating and fuel handling equipment-Smithy Forge, Blower, Shovel, Poker.

Holding and supporting tools-Common tongs, anvil, swage block.

Striking Tools-Ball pein, cross pein, Straight pein double face and sledge hammers .

Cutting tools - Hot and cold chisel and shear set.

Punching & Drafting Tools - Punch & Drift. Bending Tools and fixture.

Forming & Finishing Tools - Fullers, Swage Flatters, Set hammers.

Defects likely to occur during and after operations their Identification and Remedy.

Defects due to wrong operation, wrong tool and wrong heating.

Safety of Personnel, Equipment & Tools to be observed. 7

UNIT-III

Sheet Metal Working:

Tools and Operation: Operations involved (Names and concept only)

Laying out, marking and measuring, cutting, Shearing and blanking, Straightening bending and seaming, Punching and piercing, burring and stamping,

Sheet metal joints - Lap, seam, Locked seam, hemp,wirededge, cup or circular, Flange, angular and cap. Tools and equipments used (Name, size,

Specification for identification only).

Marking Tools- Scriber, Divider and Trammel, Protractor, Trysquare, Dot punch, Steel Rule, Steel tape, Sheet metal gauge.

Cutting and shearing Tools-hand Shear and lever, Snips, Chisels.

Straightening tool-Straight edge.

Striking Tools-Mallet, Hammer.

Holding Tools-Vice, Plier, C or G clamps, Tongs.

Supporting Tools-Stakes and Anvil.

Bending Tools-Crimpers, Form dies, Roundnose plier, Rails.

Punching-Piercing and Drifting tools.

Burring Tools-Files.

Common defects likely to occur during and after operation-Their identification and remedy.

Defects due to wrong operation or wrong tool.

Safety of Personnel, Equipment & Tools to be observed. 7

UNIT-IV

Metal Joining During Fabrication:

Permanent Joining: Welding methods-Forgewelding, gas welding (high

And low pressure-oxyacetylene welding, types of flames.

Electric welding- D.C. & A.C., Connected tools, operation, materials and safety measures.

Soldering & Brazing:

For black Galvanised and Tincoated Iron sheet, brass and copper sheets only. Its concept, comparison with welding as joining method and classification, electric soldering and forge soldering.

Soldering operation- edge preparation of joints, Pickling and degreasing, Fluxing, Tinning and Soldering.

Materials Used-Common fluxes, soft and hard solder, solder wire (Plain and Resin core) and sticks, spelters and their specifications and description (For Identification Only), forge soldering bits.

Electric soldering iron.

Common defects likely to occur during and after soldering.

Safety of Personnel, Equipment & Tools to be observed.

Rivetting: Its comparison with welding as joining method. Rivets and Materials.

Operation involved-Marking from given data, edge preparation, drilling and punching arrangements of joint elements (Lap, Butt with single cover plate and double cover plate) upsetting of rievet tail, shaping head and caulking.

Tools and equipments used- (Names, Size, Specification and uses)-Supporting and holding tools (Stakes and Tonqs)-Striking tools-Ball pien, Straight pien and Cross pien hammers and head forming tools (Shapes), drills punches and solid punches, drift, elementary knowledge about working of pneumatic, hydraulic and electric rivetor.

Temporary Joining (Fastners & Their Uses): Introduction to Various types of Bolts (Names of prats and specification) and various types of washers and nuts used with them and their uses, material they are made of , studs and foundation bolts.

Screws, keys, pins and cottors-their material and use.

Pipe connectors-Sockets, elbows, tees, cross and bends, unions, volves, glands packing and operation in use of pipe connectors-cutting, marking, threading, pipe bending, joining different pipe line fittings- (Steps of operation only). 9

UNIT-V

Tools and equipment used in their operations (Name, Size, Specification and Description for Identification).

Supporting and holding tools-Pipe vices (Bench, leg and hand), Pipe wrenches, Spanners.

Cutting Tools- Hack saw and Pipe cutters.

Threading Tools- Pipe dies and Taps.

Materials Used for Joining-White lead, Cotton and Gasket.

Common defects likely to occur during and after operation and their remedies.

(3) Familiarity with the Use of Various Tools Used In Mechanical **Engineering Workshop:**

Marking & Measuring: Steel rule, surface gauge, marking block, protractor, trysquare, scriber, punches, divider and callipers, surface plate, V. block, gauges- (screw, pitch, radius, feeler), Vernier callipers, Micrometer, Vernier height and depth gauge, use of dialgauge.

Holding Tools: Vices (Bench, leg and hand vice), clamps tongs, pliers,
Cutting Tools: Hack saw (Fixed and Adjustable framce), chisels-flat, cross cut, diamond, round nose.
Files: According to section-Knife edge, Flat, Triangular round, Square, Half round, According to grade - Rough, Bastard, Second cut, Smooth
And Dead smooth,
Drills and Allied Tools: Parallel and taper shank Twist drill,
Thread Cutting Tools: Taps and Dies,
Miscellaneous Tools: Wrenches, Keys, Spaners, Pliers, Screw drivers their
Specification and many others which have not been named for use in various shops. They should be shown physically to each student for famillarity.

Protection of fabricated Structures from Weather:

1. Painting: Its need, Introduction to methods of paintings (Classification only); Manual, Machine (spray) and dip painting at room temperature, operations involveddiscription of steps only eg. surface preparation method for old and new surface in timber and iron structure-sanding, derusting, deqreasing, filling of pore and dents, paint application- manual, machine (spray and dip painting drying of paint air drying and oven drying under coat and filler material (red oxide, putty, yellow clay), surface preparation materials (sand and emery papers); tools and equipments used (Name, size specification for indification).
Brushes-Round and flat wire brush, scraper, trowel, spray gun, compressor.
Defects likely to occur in painting and their remedies
Safety of Personnel, Equipment & Tools to be observed.

2. Varnishing and Polishing:
Its need operation involved (description of step only), surface preparation method of old and new articles, application of polishing materials, materials used for preparation of french and sprit polish,copal varnish.
Defects likely to occur.
Safety of Personnel, Equipment & Tools to be observed.

3. Foundry Work :
Elementary idea of patterns, green sand moulds and moulding, tools and equipment used in green sand moulding.

4. Machine Shop :
Introduction to machine tools viz lathe, drilling machine, shaper and planer simple line and block diagram of components and their functions. Brief concept of NC and CNC machines.

APPLIED PHYSICS LAB
(DPH-151/DPH-251)

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Note: Any ten experiments are to be performed.

1. Determination of 'g' using simple pendulum.
2. To find the surface Tension of water by the method of capillary rise.
3. To determine the frequency of A.C. mains by using a sonometer and a horse shoe magnet.
4. To determine the value of modulus of rigidity of given material of a Wire by statical method using Barton's apparatus.
5. Determination of coefficient of viscosity of water by capillary flow (Poiseuilles method).
6. To determine the height of a tower by Sextant.
7. To determine the moment of Inertia of a flywheel.
8. Determination of velocity of sound by resonance tube.
9. Determination of resistivity of a given wire by Post Office Box.
10. by using Potentiometer, determination of
    (i) E_1/E_2
    (ii) Internal resistance of given cell.
11. Determination of coefficient of friction on a horizontal plane.
12. Determination of viscosity coefficient of a lubricant by Stoke's law.
13. Determination of Spring Constant.
14. Verification of Kirchoff's laws.
15. To draw the characteristics of a p-n junction diode.

WORKSHOP PRACTICE
(DWS-151)

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1. **Machine Shop**
    a. Study of tools and operations
    b. Plane turning
    c. Step turning
    d. Taper turning
    e. Threading
    f. Single point cutting tool grinding
2. **Fitting Bench Working Shop**
    a. Study of tools and operations
    b. Simple exercises involving filing work
    c. Making perfect male-female joint
    d. Simple exercises involving drilling/tapping/dieing
3. **Black Smithy Shop**
    a. Study of tools and operations
    b. Simple exercises based on black smithy operations such as Upsetting/drawingdown, punching, bending, fullering and swaging
4. **Welding Shop**
    a. Study of tools and operations
    b. Simple butt Joint
    c. Lap Joint
    d. Oxy acetylence welding
5. **Sheet Metal Shop**
    a. Study of tools and operations
    b. Making funnel complete with soldering
    c. Fabrication of tool box, tray, electrical panel box etc.
6. **Carpentry Shop**
    a. Study of tools and operation and carpentry Joints.
    b. Simple exercise using jack plain
    c. To prepare half lap corner, joint, mortise and tennon joints.
    d. Simple exercise on woodworking lathe.
7. **Foundry**
    a. Making a mould using single piece pattern
    b. Making a mould using two piece pattern
    c. Making a mould using a pattern with core print
    d. Making Pouring and Making an Aluminium Casting.

. APPLIED MECHANICS LAB
(DAM-151/251)

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1. To verify the law of Polygon of forces.
2. To verify the law of parallelogram and triangle of forces.
3. To verify the law of principle of moments.
4. To find the coefficient of friction between wood, steel, copper and glass.
5. To find the reaction at supports of a simply supported beam carrying point loads only.
6. To find the forces in the jib & tie of a jib crane
7. To find the forces in the members of a loaded roof truss.
   (King / Queen post truss)
8. To find the mechanical advantage, velocity ratio and efficiency of any three of the following machines:
   (i) Simple wheel & axle
   (ii) Differential wheel & axle
   (iii) Differential pulley block
   (iv) Simple Screw jack
   (v) Simple Worm & worm wheel
   (vi) System of Pulleys (any type).

PROFESSIONAL COMMUNICATION LAB
(DPC-151)

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UNIT-I

Introduction to speech sounds through (IPA) International Phonetic Alphabet.

- Pronounciation practice emphasizing the articulation of vocal sounds & Word stress.
- Pronounciation Practice emphasizing the words with spelling pronounciation Mismatch.

UNIT-II

- Techniques of giving focused self description in formal communication Situations.
- Practice in describing objects.

UNIT-III

- The basics of group discussion.
- Common pitfalls in group discussion.
- Techniques for making a claim & supporting it in group discussion.
- Techniques for offering polite but firm counter arguments.
- Participating in a Debate.

UNIT-IV

- The essentials of Seminar Presentation.
- Techniques for preparing a Seminar Presentation.
- Mock Interview: Preparation, Unfolding of personality and expressing Ideas effectively.
- Role Play/General Conversation, Making polite enquiries at Railway station, Post Office and other Public Places.

UNIT-V

Project:

At the beginning of the Semester each student in the class will be given topics for one informative & one persuasive speech to be delivered by him/her towards the end of the semester. The students will research for, organize and finalize the speeches under the guidance of the subject teacher. For each speech, the student will submit a one page written outline.

Software:

- Learn to Speak English (BPB Multimedia)
- A talking Dictionary.
- CD's of Professional Communication.

References:

1. Grant Taylor: English Conversation Practice (T.M.H.)
2. Grathe King :Colloqnial English Routledge London