



**SARVAPALLI RADHAKRISHNAN UNIVERSITY,  
BHOPAL (M.P.)**

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**CURRICULUM  
FOR  
DIPLOMA IN  
CIVIL ENGINEERING**

**(FIRST SEMESTER)**

**GROUP B**

**Implemented from session 2015-16**

**Under Credit based grading system**



**SARVAPALLI RADHAKRISHNAN UNIVERSITY,  
BHOPAL (M.P.)**

**DIPLOMA IN  
CIVIL ENGINEERING**

SEMESTER: **FIRST**

NAME OF COURSE: **APPLIED MECHANICS**

PAPER CODE: **6000**

**COURSE CONTENTS**

| S.NO. | TOPIC                                       | CONTENTS  |
|-------|---|---|
| 1.    | <b>COMPOSITION AND RESOLUTION OF FORCES</b> | Definition , Effect, characteristics of force<br>System of Forces<br>Principle of Transmissibility of Forces<br>Concept of Resultant Force<br>Law of –<br>Parallelogram of Forces<br>Triangle of Forces<br>Polygon of Forces<br>Determination of Resultant of two or more concurrent forces ( analytically and graphically) |
| 2.    | <b>PARALLEL FORCES AND COUPLES</b>          | Classification of Parallel Forces<br>Methods of finding resultant Force of parallel forces- analytically & graphically<br>Position of resultant force of parallel forces<br>Definition, Classification and characteristics of a force Couple, moment of couple  |
| 3.    | <b>MOMENTS AND THEIR APPLICATIONS</b>       | Definition, Types and law of moment<br>Varignon's Principle of moment and its applications<br>Lever and its Applications<br>Types of supports and determination of support reactions of a simply supported beam subjected to point load and uniformly distributed load (UDL)  |



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| S.NO. | TOPIC                          | CONTENTS  |
|-------|--------------------------------|---|
| 4.    | <b>EQUILIBRIUM OF FORCES</b>   | Equilibrium of a system of concurrent forces<br>Conditions and types of Equilibrium<br>Lami's Theorem and its applications  |
| 5.    | <b>CENTRE OF GRAVITY</b>       | Difference between Centroid and Center of Gravity (CG)<br>Centroid of standard plane figures and CG of simple solid bodies<br>Method of finding out Centroid of composite plane laminas and cut sections<br>Method of finding out CG of Composite solid bodies  |
| 6.    | <b>FRICTION</b>                | Concept and types of friction<br>Limiting Friction, coefficient of friction, angle of friction, angle of repose<br>Laws of friction ( Static and Kinetic)<br>Analysis of equilibrium of Bodies resting on Horizontal and inclined Plane<br>Utility / Nuisance value of friction   |
| 7.    | <b>SIMPLE LIFTING MECHINES</b> | Concept of lifting Machines<br>Definition of Mechanical Advantage, Velocity Ratio and Efficiency of Machines and their relation<br>Reversibility of Machines and condition for self locking machine<br>Law of Machines, Maximum mechanical advantage and maximum efficiency of machine<br>Friction in machine ( In terms of Load and effort)<br>Calculation of M.A., V.R. and efficiency of following machines<br>- Simple wheel and axle<br>- Differential wheel and axle<br>- Single purchase crab<br>- Double purchase crab<br>- Simple screw jack<br>- Different System of simple pulley blocks |
| 8.    | <b>MOTION OF A PARTICLE</b>    | Definition of speed, velocity, acceleration, uniform velocity, uniform acceleration and variable acceleration   |



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| S.NO. | TOPIC                             | CONTENTS  |
|-------|-----------------------------------|---|
| 9.    | <b>LAWS OF MOTION</b>             | Motion under constant acceleration/<br>retardation ( equations of motion)<br>Motion under force of gravity<br>Concept of relative velocity<br>Definition of projectile, velocity of projection<br>, angle of projection, time of flight, maximum<br>height, horizontal range and their determination<br>Definition of angular velocity, angular<br>acceleration and angular displacement<br>Relation between linear and angular<br>velocity of a particle moving in a circular path<br>Motion of rotation under constant angular<br>acceleration<br><br>Newton's Laws of motion and their<br>applications |
| 10.   | <b>WORK, POWER AND<br/>ENERGY</b> | Definition unit and graphical representation<br>of work<br><b>Definition and unit of power and types of<br/>engine power and efficiency of an engine.</b><br><b>Definition and concept of Impulse</b><br><b>Definition, unit and types of energies</b><br><b>Total energy of a body falling under gravity</b>   |



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PAPER CODE: **6000**

| <b>NO.</b> | <b>NAME OF THE EXPERIMENT</b>  |
|------------|--|
| <b>1</b>   | Verification of laws of parallelogram of forces.   |
| <b>2.</b>  | Verification of laws of polygon of forces  |
| <b>3.</b>  | Verification of laws of moments  |
| <b>4.</b>  | Determination of forces in the members of Jib Crane  |
| <b>5.</b>  | Determination of Centroid of plane lamina by graphical method  |
| <b>6.</b>  | Determination of coefficient of friction for surfaces of different materials on horizontal plane   |
| <b>7.</b>  | Determination of coefficient of friction for surfaces of different materials on an inclined plane  |
| <b>8.</b>  | Determination of mechanical advantage, velocity ratio and efficiency of the following lifting machines <ul style="list-style-type: none"><li>• Simple wheel and axle</li><li>• Differential wheel axle</li><li>• Single purchase crab</li><li>• Double purchase crab</li><li>• Simple pulley block</li><li>• Simple screw jack</li></ul> |
| <b>9.</b>  | Measurement of B.H.P. of an engine using roap break dynamometer  |



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## **DIPLOMA IN CIVIL ENGINEERING**

SEMESTER: **FIRST**

NAME OF COURSE: **APPLIED MECHANICS**

PAPER CODE: **6000**

### **REFERENCES**

1. A text book of Applied Mechanics – R.S. Khurmi , S.C. Chand & Co. , New Delhi
2. Applied Mechanics – I.B. Prasad, Khanna Publishers, New Delhi
3. Applied Mechanics ( Hindi) – R.S. Jog, Anand Publishers, Gwalior
4. Applied Mechanics ( Hindi) – A.R. Page, Deepak Prakashan, Gwalior



**SARVAPALLI RADHAKRISHNAN UNIVERSITY,  
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**DIPLOMA IN  
CIVIL ENGINEERING**

SEMESTER: **FIRST**

NAME OF COURSE: **ENVIRONMENTAL  
ENGINEERING AND SAFTY**

PAPER CODE: **2001**

**COURSE CONTENTS**

| S.NO. | TOPIC                                    | CONTENTS   |
|-------|--|--|
| 1.    | <b>INTRODUCTION TO ENVIRONMENT</b>       | <ul style="list-style-type: none"><li>- THE BIOSPHERE, biotic and abiotic</li><li>- An aquatic ecosystem</li><li>- Types of pollution</li><li>- Impact of human being on environment.</li><li>- Impact of environment on human being</li><li>- Basic approach to improve environmental qualities</li><li>- Role of an environmental engineer</li></ul>   |
| 2.    | <b>AIR POLLUTION SOURCES AND EFFECTS</b> | <ul style="list-style-type: none"><li>- Standard definition of air pollution</li><li>- Composition of natural air</li><li>- Names of air pollutants</li><li>- Classification of air pollutants, primary and secondary pollutants</li><li>- Classification of source of air pollutants on different bases</li><li>- Definition of different types of aerosols.</li><li>- Effect of air pollution on: human health, material properties, vegetation.</li><li>- Major toxic metals and their effects</li><li>- Major environmental phenomenon e.g., acid rain, global warming, green house effect, ozone layer depletion.</li><li>- Air quality standards</li><li>- Brief description of air pollution laws</li></ul> |



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| <b>S.NO.</b> | <b>TOPIC</b>  | <b>CONTENTS</b>  |
|--------------|---|--|
| 3.           | <b>METEOROLOGICAL ASPECTS OF AIR POLLUTANT DISPERSION</b> | Meteorological parameters influencing air pollution<br>Environmental lapse rate, temperature inversion, atmospheric stability and adiabatic loss rate.<br>Turbulence, topographical effects,<br>Plume behavior, looping, coning, fanning<br>fumigation, lofting, trapping.   |
| 4.           | <b>AIR POLLUTION CONTROL METHODS AND EQUIPMENTS</b>       | Natural purification processes of air<br>Artificial purification methods of air<br>Brief description of following control equipments along with sketch e.g, gravitation settling chamber, cyclone, scrubber, bag house filter, electrostatic precipitator.<br>Brief description of following processes for the control of gaseous pollutants e. g., absorption, adsorption, condensation, combustion etc |
| 5.           | <b>WATER POLLUTION SOURCES AND CLASSIFICATION</b>         | Water resources<br>Uses of water<br>Classification of water<br>Origin, composition and characteristics of domestic waste water as well as industrial waste water<br>Biochemical oxygen demand<br>Water pollution laws and standards<br>Uses of waste water<br>Classification of waste water  |
| 6.           | <b>WASTE WATER TREATMENT METHOD</b>                       | Chemical oxygen demand<br>basic processes of water treatment<br>Meaning of primary, secondary and tertiary treatment<br>Flow chart of a simple effluent treatment plant<br>Theory of industrial waste treatment<br>Volume reduction, neutralization and proportioning  |
| 7.           | <b>SOLID WASTE MANAGEMENT</b>                             | Sources and classification of solid waste<br>Public health aspects<br>Disposal methods – open dumping , sanitary , land fill<br>Incineration , composting<br>Potential methods of disposal<br>Recovery and recycling of paper, glass, metal and plastic  |





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| S.NO. | TOPIC                              | CONTENTS   |
|-------|------------------------------------|--|
| 8.    | <b>NOISE POLLUTION AND CONTROL</b> | <ul style="list-style-type: none"><li>- Sources of noise pollution</li><li>- Units of Noise pollution measurement</li><li>- Allowable limits for different areas</li><li>- Problems of noise pollution and measures to control it</li><li>- Noise pollution control devices brief discussion</li></ul> |
| 9.    | <b>SAFETY PRACTICES</b>            | <ul style="list-style-type: none"><li>- Responsibility of employees and employers regarding health and safety</li><li>- Fire hazards ,prevention and precautions</li><li>- Industrial hazards prevention and protection</li><li>- Protection from air and noise pollution</li></ul>                    |



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SEMESTER: **FIRST**

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ENGINEERING AND SAFTY**

PAPER CODE: **2001**

**LIST OF EXPERIMENTS**

| NO. | NAME OF THE EXPERIMENT   |
|-----|--|
| 1.  | <b>GROUP A AIR POLLUTION</b> (Any one experiment may be selected from this group)<br>1. Air monitoring and determination of SPM, CO, Nox, SO <sub>2</sub> with high volume sampler.<br>2. Monitoring of stack gases and determination of SPM, CO, Nox, SO <sub>2</sub> with slack monitoring kit.<br>3. Determination of CO,HC, in exhaust gases from petrol vehicle |
| 2.  | <b>GROUP B NOISE POLLUTION</b><br>4. Determination of sound pollution in (a) Auditorium (b) Factories (c) Busy roads (d) Theatre (e) TV rooms ( select any three situations)   |
| 3.  | <b>GROUP C INDUSTRIAL WASTE WATER</b> (Any Two experiment may be selected from this group)<br>5. Determination of BOD/COD ratio in industrial waste water.<br>6. Determination of Ph and alkanity/ acidity in industrial waste water.<br>7. Determination of solids in industrial waste water.   |
| 4.  | 8. Determination of turbidity, cobur,and temperature of industrial waste water.<br><b>GROUP D POLLUTION STANDARDS</b> (Any Two experiment may be selected from this group)<br>9. Study of drinking water standards.<br>10. Study of effluent standards for water disposal.<br>11. Study of air pollution standards.  |



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**SEMESTER: FIRST**  
**NAME OF COURSE: ENVIRONMENTAL  
ENGINEERING AND SAFTY**

**PAPER CODE: 2001**

**REFERENCES**

1. Environmental pollution control Engineering by C.S. Rao
2. Air pollution and control by Seth
3. Air pollution by M.N Rao
4. Industrial waste and its treatment by Seth
5. Paryavaran Yantriki Hindi granth akadami



**SARVAPALLI RADHAKRISHNAN UNIVERSITY,  
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**DIPLOMA IN  
CIVIL ENGINEERING**

SEMESTER: **FIRST**

NAME OF COURSE: **INTRODUCTION TO  
COMPUTER**

PAPER CODE: **5000**

**COURSE CONTENTS**

| S.NO. | TOPIC                                | CONTENTS  |
|-------|--------------------------------------|---|
| 1.    | <b>INTRODUCTION TO<br/>COMPUTERS</b> | Basic Concepts<br>Generations of Computers Overview of computer<br>Systems Classifications of Computers<br>Characteristics of Computers Applications of<br>Computers.<br>Numbers System & Codes<br>– Decimal, Binary, Octal,<br>Hexadecimal<br>– Conversions from one system<br>to other<br>– Binary Coded Decimal & ASCII<br>Code<br>Computer Hardware<br>Input Devices<br>Keyboard, Mouse, Trackball, Joystick,<br>Scanner, OMR OCR Bar-Code Reader, MICR,<br>Digitizer, Card Reader, Voice Recognition,<br>Web Cam, Video Cameras, Etc. Output Devices<br>Monitors, Printers : Dot matrix, Inkjet & Laser,<br>Plotters, Commuter, Output Micro Film (COM),<br>Multimedia Projector, Speech Synthesizer,<br>– Dumb, Smart & Intelligent |



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| S.NO. | TOPIC                   | CONTENTS   |
|-------|-------------------------|--|
| 2.    | <b>OPERATING SYSTEM</b> | <p>Terminal.<br/>Storage Devices<br/>Primary and Secondary Storage, Characteristics and Limitation,<br/>Floppy,<br/>Hard disk, CD ROM DVD, Disk Cartridge.<br/>Microprocessor Registers, Arithmetic Unit,<br/>Control Unit, Buses,<br/>Instruction Set, Processor Speed.<br/>Memory Concepts<br/>Concept of Memory, Unit of Memory, Types of memory, RAM, ROM, PROM, EPROM,<br/>– EEPROM, Cache Memory.<br/>Computer Software<br/>Computer Software<br/>System Software V/s Application Software<br/>Operating System Programs Language Processor, Assembler, Compiler &amp; Interpreter.<br/>Application Software<br/>Types of Application Software and their examples.<br/>High Level Language, Low Level Language, Assembly Language.<br/>Multimedia<br/>Basics of Multimedia Components- Text, Graphics, Animation, Audio, Images &amp; Video.<br/>Multimedia Applications.</p> <p>Overview of DOS<br/>Internal Commands External Commands<br/>Windows Operating System<br/>Overview of different versions of Windows<br/>Characteristics and Facilities of Windows,<br/>– Terminologies of Windows –<br/>Desktop, Icon,</p> |



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| <b>S.NO.</b> | <b>TOPIC</b>               | <b>CONTENTS</b>   |
|--------------|----------------------------|---|
| 3.           | <b>WORD PROCESSING</b>     | <p>Menu etc. Components of Desktop. Working with Files and Folders. Windows Utilities and Accessories – Notepad, WordPad, Paintbrush, – Windows Explorer, Calculator. 2.3 Introduction to Linux</p> <p>An overview of Linux<br/>Basic Linux elements System Features Software Features File structure<br/>Linux H/W &amp; S/W requirements.</p> <p>Saving, Closing, Opening of documents<br/>Selecting text Editing text<br/>Finding and replacing text\ Printing documents<br/>Merge Documents Character and paragraph Formatting<br/>Page Design and layout Spell Check<br/>Creating Tables and Charts.<br/>Handling Graphics</p>   |
| 4.           | <b>SPREADSHEET PACKAGE</b> | <p>Spreadsheet concept – Need, advantage, Terminology like cell, row, column etc.</p> <p>Working with Spreadsheet – Creating, Saving, Editing and printing<br/>Entering data – Entering number, text, date, time etc.</p> <p>Selecting cells – Cut, copy, paste date<br/>Editing Worksheet data Formatting – Text and Cells, Applying border shading, background patterns, conditional formats, positioning cells, formatting numbers, text, Date, time.</p> <p>Creating formulas- Entering, Editing, Using Functions, controlling calculations.</p> <p>– Working with Charts- Creating charts, Adding &amp; changing text, changing the view and display, types of charts.</p> |



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| S.NO. | TOPIC  | CONTENTS  |
|-------|--|---|
| 5.    | <b>PRESENTATION SOFTWARE</b>                 | Introduction<br>Presentation design tools Presentation terminologies Creating, Opening and Saving Presentation<br>Working with different views Creating and Organizing slides Adding and Formatting text in slides<br>Formatting paragraphs Adding drawings and objects Creating special effects Working with table and charts Printing Presentation  |
| 6.    | <b>DATABASE</b>                              | Introduction – need, Characteristics and terminologies of database<br>Types of database – relational, Hierarchical and Network<br>Basic entities – Tables, records, Data types, Data Validation and constraints, keys relation between tables.<br>Query – Select, Insert, Update, Delete.<br>Forms – Creating forms, Forms controls<br>Report Designer- Customize formats, grouping reports   |
| 7.    | <b>COMPUTER COMMUNICATION &amp; NETWORKS</b> | <b>7.1 Information Networks</b><br>– The Technology of Workgroup Computing<br><b>Types of network Network topology Network components</b><br><b>7.2 Data Communication</b><br>– Introduction to Data Communication<br><b>Types of Data Transmission media</b><br><b>7.3 Internet and E-mail</b><br><b>Internet Basics Websites- Applications, terminologies, naming conventions.</b><br>– Web Browsers- Types, Navigation and tools |



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| <b>S.NO.</b> | <b>TOPIC</b> | <b>CONTENTS</b>   |
|--------------|--------------|---|
|              |              | <p><b>E-mail – concept, terminologies, mailing services provider, advantages comparison with Conventional mailing</b></p> <p><b>Search engine – concept, search engine websites, searching methods.</b></p> |





# SARVAPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

## **DIPLOMA IN CIVIL ENGINEERING**

SEMESTER: **FIRST**

NAME OF COURSE: **INTRODUCTION TO  
COMPUTER**

PAPER CODE: **5000**

### **LIST OF EXPERIMENTS**

| <b>S.NO.</b> | <b>NAME OF THE EXPERIMENT</b>  |
|--------------|--|
| 1.           | Study of various components of computer like CPU, keyboard, mouse, monitor, printer, CVT and storage devices.  |
| 2.           | Internal and external commands of DOS.   |
| 3.           | Using Windows operating system, study of desktop, control panel, accessories and settings. File management in windows explorer, Study of WordPad, NotePad, PaintBrush, Calculator etc.   |
| 4.           | Study of Linux operating system.   |
| 5.           | Study of MS-word – opening and saving of documents, formatting, editing and spell check, find and replace, printing, merging. Creating Table, Charts and Graphics.                       |
| 6.           | Study of Spreadsheet – creating, saving, editing and printing. Entering data, selecting cells, formatting text, applying border shades and formulas, creating charts.                    |
| 7.           | Study of Power Point – creating, opening, editing and saving of slides. Adding and formatting text, creating animations, working with images and special effects. Printing presentation. |
| 8.           | Study of MSAccess– creating, saving, editing and printing of tables. Managing relationships, writing queries e.g. SELECT, UPDATE, DELETE, INSERT. Forms designing and report printing.   |
| 9.           | Study of Web Browser and mailing programs.   |



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## **DIPLOMA IN CIVIL ENGINEERING**

SEMESTER: **FIRST**

NAME OF COURSE: **INTRODUCTION TO  
COMPUTER**

PAPER CODE: **5000**

### **REFERENCES**

1. A First Course in Computers  
- S . Jaiswal Golgotha Publication
2. Computers & Application,  
-Slotnick, Butterfield, Colantonio and Kopetzky C.C. Health & Company
3. Computers Today,  
-Suresh K. Basandra Galgotia Publication
4. The Complete Guide to Microsoft Office Professional,  
-Ron Mansfield Sybex /BPB Asian Edition
5. Inside IBM PC  
-Norton Peter
6. Hardware Bible  
-BPB Publication
7. Computer Hardware  
-Osborne Series
8. DOS & Utilities  
-BPB Publication
9. Learning Windows in 24 Hours  
-Sam Techmedia
10. Multimedia Making it work  
-Tay Vaughan Tata McGrawHill
11. Understanding windows  
-BP Chapman B Publicati



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**DIPLOMA IN  
CIVIL ENGINEERING**

SEMESTER: **FIRST**

NAME OF COURSE: **ENGINEERING DRAWING**

PAPER CODE: **5000**

**COURSE CONTENTS**

| S.NO. | TOPIC   | CONTENTS  |
|-------|---|---|
| 1.    | <b>INTRODUCTION TO DRAWING INSTRUMENTS:</b>   | <ul style="list-style-type: none"><li>- Introduction of drawing instruments, materials and their uses</li><li>- Applications of minidrafter</li><li>- Applications of compass and divider</li><li>- Applications of French curves and spline</li><li>- Pencils grades and their uses</li><li>- Designation and sizes of drawing sheet and drawing board</li></ul> |
| 2.    | <b>PLANNING AND LAY- OUT OF DRAWING SHEET</b> | <ul style="list-style-type: none"><li>- Planning of drawing sheet as per I.S.: 696-1972 (SP 46: 1988)</li><li>This should include<ul style="list-style-type: none"><li>- Margin.</li><li>- Title Block.</li><li>- Zoning.</li><li>- Revision panel.</li><li>- Folding marks.</li><li>- Numbering of sheet.</li></ul></li></ul>                                    |
| 3.    | <b>CONVENTIONAL REPRESENTATION:</b>           | <p>Conventional representation of the following as per BIS practice</p> <ul style="list-style-type: none"><li>- Common Engineering materials</li><li>- Electrical installations and fittings – Main switches, (lighting and power), socket outlets (3 pin 5AMP, 3pin15AMP), bell, buzzer, loud speaker, Aerial, ceiling fan, exhaust fan,</li></ul>               |



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| S.NO. | TOPIC   | CONTENTS   |
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| 4.    | <b>LINES, LETTERING<br/>AND DIMENSIONING</b>                        | <p>Bracket fan, fan regulator, battery and earth point.<br/>           - Electronics components-<br/>           Diode: Zener, varactor, Scotty, step recovery, light emitting diode (LED), PNP and NPN transistors, resistance, capacitor, Inductors (fixed and variable both), IC (8pin and 14pin)<br/>           SCR, TRIAC, DIAC, UJT, FET, MOSFET, LOGIC GATES<br/>           Sanitary fittings- showerhead, wall lavatory basin, corner<br/>           Lavatory basin, urinal stall, kitchen sink, Indian type WC, Water closets (Asian pan, urissapan, Anglo-Indian, European)<br/>           Building -single and double swing doors and windows.<br/>           Mechanical components- Internal and external threads, slotted head,<br/>           Square end and flat, radial arms and ribs, serrated shaft, splined shaft,<br/>           Chain wheel, bearing, straight and diamond knurling, Compression and tension spring, leaf spring (with and without eye),<br/>           Spur and helical gear</p> <p>Introduction of type of lines and their applications<br/>           Single stroke vertical, inclined letters (capital and lowercase) and numerals.<br/>           - Dimensioning:<br/>           - Elements of dimensioning- dimension line, extension line, arrowhead<br/>           And leader line<br/>           Dimensioning system – Aligned and unidirectional.<br/>           Dimensioning of Arcs and Circles.<br/>           Angular Dimensioning.<br/>           Dimension of counter sunk and counter bore.</p> |
| 5.    | <b>GEOMETRICAL<br/>CONSTRUCTIONS<br/>AND ENGINEERING<br/>CURVES</b> | <p>Divide a line into any number of equal parts by parallel line method<br/>           Bisecting of line and angle.<br/>           Construction of triangles and polygons<br/>           Introduction of conic sections (curves)</p>   |



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| S.NO. | TOPIC  | CONTENTS   |
|-------|--|--|
| 6.    | <b>SCALES:</b>   | <ul style="list-style-type: none"><li>- Construction of Ellipse by Eccentricity and Concentric circles methods</li><li>- Construction of Parabola by Eccentricity and Rectangle methods</li><li>- Construction of Hyperbola by Eccentricity method</li><li>- Construction of Cycloid</li><li>- Construction of Involutés of circle and polygon</li><li>- Construction of Archimedean Spiral of any number of convolutions</li><br/><li>- Introduction of scales and their applications</li><li>- Concept of reducing, enlarging and full size scale</li><li>- Classification of scales – plain, diagonal, vernier,</li><li>- Scale of chord and comparative scales</li><li>- Definition of R.F</li><li>- Construction of plain and diagonal scales</li><br/><li>- Definition of various term associated with theory of projection-</li></ul>                     |
| 7.    | <b>THEORY OF PROJECTION AND PROJECTION OF POINTS, LINES AND PLANES</b> | <ul style="list-style-type: none"><li>- Planes of projection, Quadrants, first &amp; third angle projection method</li><li>- Projection of points in all the four quadrants.</li><li>- Projection of lines-<ul style="list-style-type: none"><li>1.parallel to HP and VP both.</li><li>2.perpendicular to one plane and parallel to other.</li><li>3.Inclined to one plane and parallel to other.</li><li>4.knowledge of projection of line inclined to both the planes<br/>(No practice required)</li></ul></li><li>- Projection of planes –<ul style="list-style-type: none"><li>1Perpendicular to HP and VP both</li><li>2 Perpendicular to one plane and parallel to other</li><li>3.Inclined to one plane and perpendicular to other.</li><li>4 Knowledge of projection of plane inclined to both the planes<br/>(No practice required)</li></ul></li></ul> |



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| S.NO. | TOPIC  | CONTENTS  |
|-------|--|---|
| 8.    | <b>PROJECTIONS OF SOLIDS:</b>                              | Projection of cylinder, cone, prism and pyramid.<br>Under the following conditions:<br>1. Axis parallel to HP and VP<br>2. Axis perpendicular to HP and parallel to VP<br>3. Axis perpendicular to VP and parallel to HP<br>4. Axis inclined to HP and parallel to VP.<br>5. Axis inclined to VP and parallel to HP.<br>6. Axis inclined to both HP and VP ( No Practice required)  |
| 9.    | <b>SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES</b>       | Section of cone, cylinder, prism and pyramid (Solid resting on its base in the HP i.e. the Axis perpendicular to HP and parallel to VP) in the following cases:<br>1. Section plane parallel to HP and perpendicular to VP<br>2. Section plane parallel to VP and perpendicular to HP.<br>3. Section plane inclined to HP and perpendicular to VP.<br>4. Section plane inclined to VP and perpendicular to HP.<br>- Drawing True shape of section.<br>- Introduction to development of lateral surface of solids-<br>Cone, Cylinder, Prism and Pyramids (Simple and truncated)<br>Under the condition – solid resting on its base in the HP and axis<br>Perpendicular to HP and parallel to VP<br>Development of funnel and elbow |
| 10.   | <b>INTERSECTION OF SURFACES</b>                            | Intersection of following cases –<br>Cylinder to cylinder and Prism to prism(With their axis intersecting and perpendicular to each other.)   |
| 11.   | <b>ORTHOGRAPHIC PROJECTIONS &amp; FREE HAND SKETCHING:</b> | Principles of orthographic projections<br>Identification of necessary views and superfluous view  |



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| <b>S.NO.</b> | <b>TOPIC</b>           | <b>CONTENTS</b>   |
|--------------|------------------------|---|
| 12.          | <b>ISOMETRIC VIEWS</b> | <ul style="list-style-type: none"><li>- Selection of front view</li><li>- Preparation of necessary orthographic views of simple objects</li><li>- From given pictorial views</li><li>- Dimensioning of orthographic views as per standard practice.</li><li>- Free hand sketches of simple objects (Using Pencil, Eraser &amp; Paper only)</li></ul><br><ul style="list-style-type: none"><li>- Concept of isometric projection and isometric view (Isometric Drawing)</li><li>- Construction of isometric scale</li><li>- Construction of isometric view of polygon and circle</li><li>- Construction of isometric view of cone, cylinder, prism and pyramids</li><li>- Construction of isometric view of simple objects from given orthographic views</li></ul> |



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**DIPLOMA IN  
CIVIL ENGINEERING**

SEMESTER: **FIRST**

NAME OF COURSE: **ENGINEERING DRAWING**

PAPER CODE: **5000**

**REFERENCES**

1. ENGINEERING DRAWING  
- N.D. Bhatt
2. ENGINEERING DRAWING  
-R.K. Dhawan
3. ENGINEERING DRAWING  
-P.S.Gill
4. FIRST YEAR ENGINEERING DRAWING  
-A.C.Parkinson
5. SP: 46-1988 Bureau of Indian standard
6. PRINCIPLES OF ELECTRONICS  
- Malvino
7. ABHIYANTRIK AAREKHAN  
-SHIVDATT UPADHYAY





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**DIPLOMA IN  
CIVIL ENGINEERING**

SEMESTER: **FIRST**

NAME OF COURSE: **WORKSHOP PRACTICE**

PAPER CODE: **6002**

**COURSE CONTENTS**

| <b>S.NO.</b> | <b>TOPIC</b>                     | <b>CONTENTS</b>  |
|--------------|----------------------------------|--|
| <b>1.</b>    | <b>INTRODUCTION TO WORK SHOP</b> | <ul style="list-style-type: none"><li>- General Safety rules of workshop</li><li>- State the General Safety Measures to be observed in Workshop.</li><li>- State the General house keeping activities</li><li>- Prepare a list of general safety Rules to be followed in Workshop</li></ul>  |
| <b>2.</b>    | <b>FITTING SHOP</b>              | <ul style="list-style-type: none"><li>- Layout of Shop</li><li>- Sketch &amp; Label Details of shop Layout</li><li>- Type of jobs produced in fitting shop</li><li>- Understand the functions of fitting shop</li><li>- Understand different Metals, Alloys &amp; their Sections</li><li>- List the Commonly used Metals, Alloys.</li><li>- State at least Five Sections, Shape &amp; Size of Metals, Alloys.</li><li>- Use relevant IS Code for commonly used materials with their samples of different Cross sections.</li><li>- Fitting tools.</li><li>- Know use of fitting tools, sketch various tools &amp; label their parts.</li><li>- Classify fitting tools as marking tools, Clamping devices, striking tools, cutting tools etc.</li><li>- Know the marking out &amp; inspection instruments such as surface plate, marking block, scribe, tri square, bevel protractor etc.</li><li>- Fitting operation: -<br/>Use of Various fitting tools, inspection &amp; measuring Instruments. To produce given jobs.</li><li>- Choose correct Shape &amp; Size of Blank for a given drawing.</li><li>- Marking as per drawing using correct method, tools &amp; sequence.</li><li>- Choose correct sequence of operations for the job viz. Sawing, filing, scraping, drilling &amp; Tapping etc.</li></ul> |



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| S.NO. | TOPIC                 | CONTENTS   |
|-------|-----------------------|--|
| 3.    | <b>CARPENTRY SHOP</b> | <ul style="list-style-type: none"><li>- Select appropriate Tools, inspection and measuring instruments.</li><li>- Clamping the job in correct position in an appropriate clamping device.</li><li>- Perform the operation with appropriate body posture, method &amp; precision, exercising personal judgment of need of the force.</li><li>- Inspect the job as and when necessary.</li><li>- Introduction to screw threads.</li><li>- Know common types of screw threads &amp; the terminology used.</li><li>- Sketch and label details of Metric &amp; Whitworth thread.</li><li>- Carpentry shop lay out.</li><li>- Sketch &amp; Label Details of shop Layout.</li><li>- Type of jobs produced in carpentry shop.</li><li>- Understand the functions of carpentry shop.</li><li>- Introduce type of jobs produced by carpenter.</li><li>- Commonly used raw materials:</li><li>- Know commonly used raw materials &amp; their commercially available size.</li><li>- Name various types of raw materials used such as Timber: - logs, planks, battens etc. Ply, Teak ply, block board, sun mica, Formica etc.</li><li>- Carpentry tools: - Know various carpentry tools with their specifications and uses e.g. different saws, chisels, gauges, scales, hammers, tri squares, planners, vice etc.</li><li>- Carpentry Joints:- Introduction of various joints like T, corner, mortise &amp; tennon joints, dovetail, pin, cross half lap joint, etc.</li><li>- Choose correct shape &amp; size of timber blank for a given job drawing.</li><li>- <b>Do marking as per drawing using correct method, tools &amp; sequence.</b></li><li>- Identify correct operations e.g. sawing, chiseling, planning, grooving etc.</li><li>- Select appropriate Tool, inspection &amp; measuring Instruments.</li><li>- Clamping the jobs in correct position in an appropriate clamping device. Perform the operation with appropriate body posture, method &amp; precision, exercising personal judgment of need.</li></ul> |



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| <b>S.NO.</b> | <b>TOPIC</b>             | <b>CONTENTS</b>   |
|--------------|--------------------------|---|
| 4.           | <b>BLACK SMITHY SHOP</b> | <p>of the force.<br/>Inspect for size &amp; quality of finish as and when necessary.<br/>Assemble the components produced. Inspect for proper joint quality &amp; take remedial steps.<br/>Understand the function of black smithy &amp; forging shop.<br/>Layout of Shop.<br/>Sketch &amp; Label Details of shop lay out.<br/>Know the different jobs produced in smithy shop e.g. round to hexagonal shapes or vice versa J -hook, S- hook, circle, chain etc.<br/>Commonly used raw materials: - M.S. Bars of different shapes and size.<br/>Smithy Tools: - Know various smithy tools with their specifications e.g. different type of hammers, hot / cold chisel, flatters, tongs, leg vice, swage block, anvils, open hearth and furnaces etc.<br/>Preparation of job (any three): J-hook, S-hook, chain, circle, tong, chisel etc.<br/>Safety measures: Know the safety regulation in black smithy shop.</p> |
| 5.           | <b>SHEET METAL SHOP</b>  | <p>Layout of Shop<br/>Sketch &amp; Label Details of shop lay out.<br/>Know the different jobs produced in sheet metal shop e.g. Open tray, cylinder, prism, Funnel etc.<br/>Commonly used raw materials: -M.S. sheet (black), G.I., M.S.rivets, and aluminum rivet etc.<br/>Understand foil, sheet and plate.<br/>Tools used:-<br/>Different snips, shears, stacks, latter punch, figure punch, Solid punch, hollow punch, mallet, soft hammers, channel, Square bars, std. Sheet gauge.<br/>Type of joints and operations: - Introduction of various sheet metal operations &amp; joints e.g. seaming, single seam, double seam, Grooved seam, corner joint, cap joint etc.<br/>Preparation of job (any two): - Open tray, cylinder, prism, Funnel etc.<br/>Choose correct shape &amp; size of sheet for a given job drawing considering allowances for joint or seam.</p>   |



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| 6.    | <b>WELDING SHOP</b>     | <p>Do marking as per drawing using correct method, tools and sequence.<br/>           Identify correct operation e.g. shearing, punching, bending, debarring, folding, strengthening, stamping, riveting, etc.<br/>           Select appropriate Tool, inspection &amp; measuring Instruments.<br/>           Holding the job in correct position.<br/>           Perform the operation with appropriate body posture, method &amp; precision, exercising personal judgment of need of the force.<br/>           Inspect for proper joint quality and take remedial steps.</p> <p>Layout of Shop.<br/>           Sketch &amp; Label Details of shop lay out.<br/>           Know the different jobs produced in Welding shop e.g. Lap joint, single butt, double butt, corner, T joint, etc.<br/>           Tools &amp; equipments used:- Specifications &amp; use of various tools and equipments used in Welding shop<br/>           e.g. A.C. welding transformer, Gas welding set, electrode used, chipping hammer, wire brush, shield, gloves, apron etc.<br/>           Preparation of job: - (any two) Lap joint, single butt, double butt, corner, T joint, etc.<br/>           Safety measures: - Know the safety regulation in Welding shop.</p> |
| 7.    | <b>PLASTIC MOULDING</b> | <p>Know the commonly used plastic materials i.e. Thermosetting, Thermo plastic.<br/>           Sketch &amp; label various parts of bench molding m/c.<br/>           Production of any product on bench molding m/c.</p>   |
| 8.    | <b>REVISION</b>         | <p>Understand the difference in theory and practice.<br/>           Explain the importance of skills in production of quality jobs</p>   |

NOTE:-1. Theoretical inputs will be provided on shop floor during workshop Practice.  
 2. Shop safety would include First Aid training for each shop.



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**DIPLOMA IN  
CIVIL ENGINEERING**

SEMESTER: **FIRST**

NAME OF COURSE: **WORKSHOP PRACTICE**

PAPER CODE: **6002**

**REFERENCES**

1. Workshop technology vol. I  
- Hazra & Chaudhary
2. Production technology vol. I  
- R.C. Patel & C.G. Gupta
3. Production technology vol. I  
- Dalela
4. Work shop technology vol. I  
- Raghuvanshi
5. Work shop technology vol. I  
- Chapman
6. Workshop Vol. I  
- P.N.Vijayvargiya (Hindi medium)



# SARVAPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

## DIPLOMA IN CIVIL ENGINEERING

SEMESTER: **FIRST**

NAME OF COURSE: **PROFESSIONAL ACTIVITIES**

### RATIONALE

**Professional Activities** is not a descriptive course, as per conventional norms; therefore specific content for this course cannot be prescribed. It is a group of open-ended activities; where in variety of tasks are to be performed, to achieve objectives. However general guidelines for achieving the target and procedure for its assessment are given under the course content.

As the student has to practice this course in all the six semesters, the guidelines given therein are common and applicable to each semester.

### OBJECTIVES:

- To allow for professional development of students as per the demand of engineering profession.
- To provide time for organization of student chapter activities of professional bodies) i.e. Institute of engineers, ISTE or Computer Society of India etc.)
- TO allow for development of abilities in students for leadership and public speaking through organization of student's seminar etc.
- To provide time for organization of guest lectures by expert engineers/eminent professionals of industry.
- To provide time for organization of technical quiz or group discussion or any other group activity.
- To provide time for visiting library or using Internet.
- To provide time for group discussion or solving case studies.
- To provide time for personality development of students.
- To provide time for working for social cause like awareness for environmental and ecology etc.

### DETAILED INSTRUCTIONS TO CONDUCT PROFESSIONAL ACTIVITIES:

- A. Study hours, if possible should be given greater time slot with a minimum of two hrs/week to a maximum of four hrs/week.
- B. This course should be evaluated on the basis of grades and mark sheet of students, should have a separate mention of the grade awarded. There will be no pass/fail in professional activities (PA).
- C. Following grade scale of evaluation of performance in PA has been established.

| <u>Grades</u> | <u>Level of performance</u> |
|---------------|-----------------------------|
| A             | Excellent                   |
| B             | Good                        |
| C             | Fair                        |



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|   |                    |
|---|--------------------|
| D | Average            |
| E | Below Expectations |

- B. Grades once obtained in a particular examination shall become final and no chance of improvement in grades will be given to the students.
- C. Assessment of performance in PA is to be done internally by the Institution, twice in a Semester/Term through a simultaneous evaluation of the candidate by a group of three teachers, of the deptt. Concerned. Group of teachers will jointly award the grade to candidate in the assessment. Best of the grades obtained by the student in these two assessments shall be finally taken on the mark sheet of the respective Semester/Term.

Candidate abstaining from the prescribed course work and/or assessment planned at the Institute shall be marked ABSENT in the mark sheet, instead of any grade.

- D. While awarding the grades for performance in PA, examining teacher should reach the final consensus based on the attendance, punctuality, interest, presentation skills in seminar on the topic assigned (collection of relevant data, observations, analysis, findings/conclusion) and its written report, awareness of latest developments in the chosen programme of study.
- E. Institution shall maintain the record of grades awarded to all the students in PA for a period of 1 year.
- F. It shall be mandatory for students to submit a compendium for his PA in the form of a Journal.
- G. Compendium shall contain following:
  - I. Record of written quiz.
  - II. Report/write up of seminar presented
  - III. Abstract of the guest lectures arranged in the Institution.
  - IV. Topic and outcome of the group discussion held.
  - V. Report on the problems solved through case studies.
  - VI. Report on social awareness camps( organized for social and environmental prevention).
  - VII. Report on student chapter activities of professional bodies like ISTE, IE (India), CSI etc.
- H. PA is not a descriptive course to be taught in the classroom by a particular teacher. Various activities involved in the achievement of objectives of this course should be distributed to a number of teachers so that the talent and creativity of group of teacher's benefit the treatment of the course content.  
These activities should preferably be conducted in English language to maintain continuity and provide reinforcement to skill development.  
Small groups shall be formed like in tutorials, group discussion, case studies, seminar, project methods, roll play and simulation to make the development of personality affective.  
Treatment of PA demands special efforts, attention, close co-operation and creative instinct on the part of teachers of department concerned. Since this course is totally learner centered, many of the activities planned under this course shall come out from the useful interaction of student, among themselves and with the teachers. The guide teacher/s shall best act as a facilitator of these creative hunts/ exercises, which unfold many of the hidden talents of the students or bring out greater amount of confidence in them, to execute certain activity.