

# CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI, CHHATTISGARH

## DIPLOMA PROGRAMME IN CIVIL/MECHANICAL/ELECTRICAL/METALLURGICAL ENGINEERING

### Semester – II

S.No	Board of Study	Subject Code	Course	Periods/Week			Scheme of Examination					Credit L+(T+P)/2	
				L	T	P	Theory			Practical			Total Marks
							ESE	CT	TA	ESE	TA		
1	Humanities	200211 (46)	Communication skills – II	4	1	-	100	20	20	-	-	140	5
2	Basic Science	200212 (14)	Applied Maths – II	3	1	-	100	20	20	-	-	140	4
3	Mechanical Engineering	200213 (37)	Applied Mechanics	3	1	-	100	20	20	-	-	140	4
4	Computer Science & Engg.	200214 (22)	Computer Fundamentals & its Applications	4	1	-	100	20	20	-	-	140	5
5	Mechanical Engineering	200215 (37)	Engineering Drawing	2	4	-	100	20	20	-	-	140	4
6	Computer Science & Engg.	200221 (22)	Computer Fundamentals & Applications Lab	-	-	6	-	-	-	100	20	120	3
7	Mechanical Engineering	200222 (37)	Applied Mechanics Lab	-	-	2	-	-	-	50	20	70	1
8	Mechanical Engineering	200223 (37)	Basic Non-Conventional Energy Sources Lab	1	-	1	-	-	-	50	20	70	2
9	Humanities	200224 (46)	PPA	-	-	2	-	-	-	-	40	40	1
<b>TOTAL</b>				<b>17</b>	<b>8</b>	<b>11</b>	<b>500</b>	<b>100</b>	<b>100</b>	<b>200</b>	<b>100</b>	<b>1000</b>	<b>29</b>

PPA : Proficiency in Professional Activates.

L : Lecture : T : Tutorial, P : Practical

ESE – End of Semester Exam.; CT – Class Test; TA- Teacher’s Assessment.



**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,  
BHILAI**

**SEMESTER** : **II**  
**COURSE TITLE** : **COMMUNICATION SKILLS -II**  
**THEORY CODE** : **200211 (46)**  
**BRANCH / DISCIPLINE** : **ALL DISCIPLINES**

**Minimum number of class tests to be conducted: 2**

**DISTRIBUTION OF MARKS AND HOURS:**

<b>S. No.</b>	<b>Chapter No.</b>	<b>Chapter Name</b>	<b>No. of Hours/Periods</b>	<b>Marks</b>
1	1	PASSAGES FOR COMPREHENSION	10	20
2	2	APPLIED GRAMMAR	25	25
3	3	PASSAGES IN GENERAL STUDIES	10	15
4	4	TECHNICAL WRITING	17	20
5	5	LETTER WRITING	18	20
		<b>TOTAL</b>	<b>80</b>	<b>100</b>

**DETAILED COURSE CONTENTS:**

**Chapter –1 : PASSAGES FOR COMPREHENSION**

- Taming the Atom
- Radar and its Uses
- A Volcano
- Precision – A Measure of Progress
- Laser

**Chapter –2 : APPLIED GRAMMAR**

- Basic Sentence Pattern
- Infinitives
- Narration
- Common Errors
- Modifiers
- Paragraph Writing

### **Chapter –3 : PASSAGES IN GENERAL STUDIES**

- Salient Features of the Indian Constitution
- Structure of Government
- Functioning of an Economic System
- Production and Productivity by
- Professional Ethics

### **Chapter –4: TECHNICAL WRITING**

- Technical Writing
  - a. A Communication Skill
  - b. Basic facts of Technical Writing
- Main Features of Technical Writing
  - a. Features of Technical Writing
  - b. Style: Literary and Technical
  - c. Mechanics of Technical Writing
- Forms of Technical Writing
  - a. Forms
  - b. Writing Definitions
  - c. Writing Technical Descriptions
  - d. Writing Technical Descriptions of Processes
  - e. Writing Instructions
- . Writing Technical Reports
  - a. Qualities of a Good Report
  - b. Forms of Reports
  - c. Types of Reports

### **Chapter –5 : LETTER WRITING**

- Introduction
- Purposes of Letters
- Characteristics of a Letter
- Mechanics and Style
- Types of Business Letters
  - Letter of Enquiry
  - Answer to an Enquiry

### **INSTRUCTIONAL STRATEGIES**

- Regular assignments should be given on every topics.
- Arranging expert lecture on specific topics.
- Assessment of term work of conduction of minimum two progressive tests during the session.
- Use of Audio-Visual aids.
- Group Discussions.
- Paper Presentation on different topic.

## LIST OF TUTORIALS

- Group discussion and seminar
- Small report writing
- Translation works
- Practice of various letter writing / precise writing / essay writing

## LEARNING RESOURCES

### (a) Reference Books:

Sl.No.	Title	Author, Publisher, Edition & Year
1	Business Communication	Asha Kaul, Prentice Hall of India Pvt.Ltd, New Delhi
2	A Course in Technical English, Book-I	Somaiya Publication Pvt. Ltd. Bombay
3	A Course in Technical English, Book-II	Somaiya Publication Pvt. Ltd. Bombay
4	Living English Structure	W.S Allen
5	Practical English Grammar	Thomos and Martinet
6.	Essentials of English & Business Communication.	Rajendra Pal, J.S Korlahalli S.Chand & Sons, New Delhi.
7.	Grammar & Composition	P R Sarkar, Anand Marg Publication, Easter, Matropolition Calcutta
8.	How To Write Correct English	R P Sinha, Bharti Bhavan Publication, Patna
9	English Errors of Indian Students	Oxford University Publication, By TLH Smith Pearse
10	Passages in General Studies	Vikas Publication, Bhopal

### (b) Others:

- VCD
- OHP Transparencies
- Computer Aided Instructional Packages
- Video/Audio Cassettes

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**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL  
UNIVERSITY, BHILAI**

**SEMESTER : II**  
**COURSE TITLE : APPLIED MATHEMATICS-II**  
**THEORY CODE : 200212 (14)**  
**BRANCH/DISCIPLINE : CIVIL/MECH./ELECTRICAL/  
METALLURGY/COMPUTER SCIENCE &  
ENGINEERING/INFORMATION  
TECHNOLOGY/INSTRUMENTATION/ELEX.  
& TELCOMMUNICATION**

**Minimum number of class tests to be conducted: 2**

**DISTRIBUTION OF MARKS AND HOURS:**

<b>Chapter No.</b>	<b>Chapter Name</b>	<b>No. of Hours/ Periods</b>	<b>Marks</b>
1.	NUMERICAL ANALYSIS	02	4
2.	FINITE DIFFERENCES	04	6
3.	NUMERICAL DIFFERENTIATION & INTEGRATION	06	10
4.	DIFFERENCE EQUATION	08	10
5.	MATRICES	12	20
6.	SIMPLE INTEGRATION	12	20
7.	FORMATION OF DIFFERENTIAL EQUATION	15	20
8.	LAPLACE TRANSFORMATION	05	10
<b>TOTAL</b>		<b>64</b>	<b>100</b>

**DETAILED CONTENT**

**Chapter – 1 : NUMERICAL ANALYSIS**

- Bisection Method
- False Position Method
- Newton-Raphson Method

## **Chapter – 2      FINITE DIFFERENCES**

- Interpolation forward differences
- Backward differences
- Factorial Polynomial
- Newton’s Forward interpolation, formula for equal intervals
- Sterling Formula (Central Difference)
- Newton’s Backward Formula
- Lagrange’s interpolation formula for unequal intervals.

## **Chapter – 3    : NUMERICAL DIFFERENTIATION & INTEGRATION**

- Numerical Differentiation (Forward & Backward Difference formula)
- Numerical Integration by Trapezoidal & Simpson’s Rule

## **Chapter – 4    :        DIFFERENCE EQUATION**

- Order of a difference equation
- Solution of Difference equation
- Complementary Section
- Particular Integral.

## **Chapter – 5    :        MATRICES**

- Introduction
- Definition
- Special Matrices
- Addition and Subtraction of Matrices
- Multiplication of Matrices
- Transpose of a Matrix
- Symmetric & Skew Symmetric Matrix
- Ad-joint of a Square Matrix
- Inverse of Matrix
- Solution of simultaneous Linear equations
- Rank of Matrix
- Consistency of Linear System of Equations

## **Chapter – 6    :        SIMPLE INTEGRATION**

- Introduction, Definition
- Method of substitution
- Integration by parts
- Integration by Partial Fraction Method
- Integration of the form and Reduction Formula.
- Definite Integral – Introduction
- Theorems Definite Integrals

- Gamma function

## **Chapter – 7 : FORMATION OF DIFFERENTIAL EQUATION**

- Differential Equations
- Definition
- Order and Degree of Differential Equations
- Formation of Differential Equations
- Solution of a Differential Equation
- Differential Equation of the first order and first degree
- Variable Separable
- Homogeneous Differential Equations
- Equations Reducible to Homogeneous form
- Linear Differential Equations
- Equations Reducible to the Linear Form
- Exact Differential Equations
- Equation Reducible to the Exact Equations
- Second order Linear Differential Equation with constant coefficient –  
Complementary function particular integral

## **Chapter – 8 : LAP LACE TRANSFORMATION**

- Definition, Transforms of Elementary functions
- Properties of Lap lace transforms
- Transform of Derivatives
- Transform of Integral

### **INSTRUCTIONAL STRATEGIES:**

- Chalk and talk method to explain various laws, theorems etc.
- Expert Lecture
- Demonstration and use of log tables
- Classroom practices for different typical exercises
- Use of derivation and formulas.



## LEARNING RESOURCES

### (a) Reference Books :

Sl. No.	Title	Author, Publisher, Edition & Year
1	Introductory Method of Numerical Analysis	Sastry S. S. (, PHI)
2	Mathematical Statistics	Ray and Sharma
3	Discrete Mathematics	Liu CL (Tata Mc Graw Hill)
4	Linear Programming	Srinath L.S. (East-West Press)
5	Set Theory and Related Topics Schum's Out Line Series	Tata Mc Graw Hill, New Delhi.
6	Finite Differences and Numerical Analysis	Saxena H.C.
7	Modern Algebra	Sharma and Seth (Ram Prasad and Sons)
8	Computer Oriented Numerical Methods, PHI	Raja Raman V. (PHI)

### (b) Others:

- Practice sheets
- Learning Packages
- Work book

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**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL  
UNIVERSITY, BHILAI**

**SEMESTER : II**  
**COURSE TITLE : APPLIED MECHANICS**  
**THEORY CODE : 200213 (37)**  
**BRANCH/DISCIPLINE : CIVIL/MECHANICAL/ELECTRICAL/  
METALLURGICAL/INSTRUMENTATION**

**Minimum number of class tests to be conducted: 2**

**DISTRIBUTION OF MARKS AND HOURS:**

S.No.	Chapter No.	Chapter Name	No. of Hours/Periods	Marks
1	1	FUNDAMENTAL CONCEPTS	3	6
2	2	COMPOSITION & RESOLUTION OF FORCES	8	14
3	3	CENTROID & MOMENT OF INERTIA	7	10
4	4	FRICTION	6	10
5	5	WORK, POWER & ENERGY	7	10
6	6	KINEMATICS	7	12
7	7	KINETICS	7	10
8	8	SIMPLE LIFTING MACHINES	10	14
9	9	TRANSMISSION OF POWER	9	14
<b>Total</b>			<b>64</b>	<b>100</b>

**DETAILED COURSE CONTENTS:**

**Chapter – 1 : FUNDAMENTAL CONCEPTS**

- Definition of Mechanics, Statics, Dynamics, Kinetics, Kinematics.
- Concept of space, mass, particle, body, rigid body.
- Scalar, vector, fundamental units, derived units.

**Chapter – 2 : COMPOSITION & RESOLUTION OF FORCES**

- **Force- concept, definition, unit, graphical representation.**
- **Concept of system of forces- non-coplanar, coplanar, concurrent, non-concurrent & parallel forces.**
- **Composition & Resolution of forces.**
- **Free body diagrams, law of parallelogram, Varignon's theorems.**
- **Equilibrium of Coplanar concurrent forces, parallel forces & non-concurrent forces, Lami's Theorem.**
- **Moment of a force and Couple.**

### **Chapter – 3 : CENTROID & MOMENT OF INERTIA**

- Location of centroid and center of gravity.
- Centroid of regular plane and compound areas.
- Center of gravity of simple solids.
- Moment of Inertia of plane areas.
- Perpendicular & Parallel. Axes theorems.

### **Chapter – 4 : FRICTION**

- Rough & Smooth surfaces, concept of friction.
- Types of friction, Coloumb's law of friction, Co-efficient of friction, angle of friction, angle of repose.
- Friction on inclined plane, Screw and Nut friction.
- Ladder and wedge friction.
- Friction in Journal bearings
- Method of reducing friction.

### **Chapter – 5 : WORK, POWER & ENERGY**

- Definition and unit of Work done, Power and Energy.
- Forms of Energy- Kinetic and Potential Energy.
- Principle of Conservation of power and energy.
- Power of engine and pumps, mean effective pressure, power measurement.
- Relation between Heat & Mechanical work, relation between Electrical & Mechanical energy.

### **Chapter – 6 : KINEMATICS**

- Kinematics in Cartesian and polar coordinates.
- Concept of speed, velocity, acceleration, radial and transverse velocity, particle under uniform and non-uniform acceleration, tangential and normal acceleration.
- Angular displacement, Angular Velocity, Angular Acceleration.
- Motion under gravity.

### **Chapter – 7 : KINETICS**

- Kinetics of particle, motion under constant force, Newton's Laws of Motion.
- Momentum and energy principles, Impulses and angular momentum.
- D' Alemberts principle.
- Motion under constant torque, Flywheel.

### **Chapter – 8 : SIMPLE LIFTING MACHINES**

- Load, Effort, Mechanical advantage, Velocity ratio, Efficiency and relation between them.
- Law of Machine, Reversibility of Lifting machine.
- Study of Machines- Differential wheel & axel, Weston differential pulley block, Simple Screw Jack, Worm & Wheel, Single and Double purchase Winch, System of pulleys.

## **Chapter – 9 : TRANSMISSION OF POWER**

- Transmission of power through Belt, Rope and Gears,
- Ratio of tension on tight and slack sides.
- Spur, Helical & Bevel gear, Rack and Pinion gear.
- Gear Trains- Simple, Compound, Reverted.

### **INSTRUCTIONAL STRATEGIES:**

- Lecture Method.
- Industrial visits.
- Expert Lecture.
- Demonstration. The course shall be taught using the laboratory side by side. Underpinning laws and Principles should be explained using desktop models. Special emphasis should be given on Laboratory experiments.

## **PRACTICAL**

**PRACTICAL CODE : 200222 (37)**

**NO. OF HOURS/PERIODS : 32**

### **LIST OF PRACTICALS / TUTORIALS:**

- Verification of law of triangle of forces.
- Verification of law of Parallelogram of forces.
- Verification of law of Polygon of forces.
- Verification of Lami's Theorem by Jib crane method.
- Demonstration of Non-concurrent, Non-Parallel forces (Funicular diagram)
- Verification of Law of Moments.
- Determination of C.G. of a given lamina.
- Determination of coefficient of friction for surfaces of different materials on-
  - a) Horizontal Plane
  - b) Inclined Plane
- Draw – V-T diagram's for different combinations of-
  - a) Velocities
  - b) Uniform accelerations
- Find-out Mechanical advantage, Velocity Ratio and Efficiency for following machines-
  - a) Simple Screw
  - b) Differential Wheel & Axle
  - c) Simple Purchase Crab
  - d) Differential Pulley Block
- Demonstration of use of inclined plane as a lifting machine.

### **LEARNING RESOURCES**

- (a) **Reference Books :**

<b>Sl. No.</b>	<b>Title</b>	<b>Author and Publisher</b>
1	A Text Book of Applied Mechanics	R.S. Khurmi, S. Chand & Company Ltd., New Delhi
2	Applied Mechanics	I. B. Prasad, Khanna Publisher, New Delhi
3	Applied Mechanics	Ramanathsn, Dhanpat Rai and Sons, New Delhi
4	Engineering Mechanics	Timoshenko & Young, Mc Garawhills Publication
5.	Engineering Mechanics	S. Rajshekaran & G. Sankarsubramaniam, Vikas Publishing House Pvt. Ltd. New Delhi
5	Strength of Material and Mechanics of Structure	Punamia, Standard Publisher Distributor New Delhi

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**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL  
UNIVERSITY, BHILAI**

**SEMESTER** : **II**  
**COURSE** : **COMPUTER FUNDAMENTALS AND ITS  
APPLICATIONS**  
**THEORY CODE** : **200214 (22)**  
**BRANCH/DISCIPLINE** : **CIVIL/MECHANICAL/ELECTRICAL/  
METALLURGICAL/INSTRUMENTATION  
/ELEX. AND TELECOMMUNICATION/  
MINING AND MINE SURVEYING**

**Minimum number of class tests to be conducted: 2**

**DISTRIBUTION OF MARKS AND HOURS**

<b>Chapter No.</b>	<b>Chapter Name</b>	<b>No. of Hours/ Periods</b>	<b>Marks</b>
1.	INTRODUCTION TO COMPUTERS	6	10
2.	MICROCOMPUTER	7	10
3.	DATA REPRESENTATION	6	10
4.	NUMBER SYSTEM	10	10
5.	COMPUTER LANGUAGE	7	10
6.	INTRODUCTION TO DOS OPERATING SYSTEM	8	10
7.	INTRODUCTION TO WINDOWS OPERATING SYSTEM	10	10
8.	COMPUTER APPLICATIONS	10	10
9.	INTERNET APPLICATIONS	8	10
10.	INTERNET CONNECTIVITY	8	10
	<b>Total</b>	<b>80</b>	<b>100</b>

***DETAILED COURSE CONTENT***

## CHAPTER - 1

### **INTRODUCTION TO COMPUTERS**

- Generations Of Computer.
  - First, Second, Third and Fourth generationHard Ware, Soft Ware , Firm Ware with Examples.
- Classification & Applications Of Computers.
  - Micro, Mini, Mainframes and Super- Computers
  - Applications of computers

## CHAPTER - 2

### **MICROCOMPUTER**

Structure & Working of Micro-Computers

Block diagram of computer

- Central Processing Unit
- Memory Unit
- Input & Output Devices

## CHAPTER – 3

### **DATA REPRESENTATION**

- Number Systems.
  - Types of number systems- Binary, Octal, Decimal, Hexadecimal
  - Bit Byte ,Nibble, ASCII code,Bcd,Gray,Excess-3,EBCDIC.

## CHAPTER – 4

### **NUMBER SYSTEM CONVERSION & ITS OPERATIONS**

- Binary addition, subtraction
  - BCD addition, subtraction.
  - 1's complement and 2's complement methods of subtraction.

### **COMPUTER LANGUAGES**

## CHAPTER – 5

- Classification and characteristics of languages.
  - Machine language.
  - Assembly language
  - High level language
- Computer Hardware
- Classification of Software: and firmware
  - System software: O.S. Loader, Linker, Interpreter, Compiler and Assembler
  - Application Software

## CHAPTER – 6

### **INTRODUCTION TO OPERATING SYSTEMS**

- Micro-Soft Disk Operating System (MS-DOS)
  - System files: BIOS, COMMAND.COM, CONFIG.SYS, Autoexec.bat file
- MS-DOS Commands.
  - Internal Commands- dir, cd, md, rd, del, ren, date, time, vol. And copy
  - External commands – attrib, format, edit, find, diskcopy, backup & Restore

## CHAPTER – 7

### **INTRODUCTION TO WINDOWS OPERATING SYSTEM.**

- Concept of Windows-Arranging, Moving, Resizing, Opening, and Closing of windows
- Folder/ File Management-Search, copy, delete and rename files

and folders

- Windows Accessories: Notepad, Word Pad, Paint

### **COMPUTER APPLICATIONS SOFTWARE**

CHAPTER – 8

- Word processing software
  - MS-WORD
- Data analysis software
  - MS-EXCEL Introduction to electronic spreadsheet
- Presentations software
  - MS-POWER POINT

### **INTERNET TECHNOLOGY**

CHAPTER – 9

- Introduction To Internet.
- Different Services Of Internet.
  - www
  - Email
  - Chat (textual /voice)
  - Bulletin Boards
  - Video conferencing
  - FTP(uploading and downloading files)
- Web-Site Access And Information Search.
  - Browsers and search engines.

### **INTERNET CONNECTIVITY.**

CHAPTER – 10

- Internet Service Provider (ISP)
- Internet accounts : Shell account, TCP/IP ISDN and Leased Line
- account and its features
- Hardware Required.
- MODEM and Terminal Adapters.

## **IMPLEMENTATION STRATEGIES**

The subject 'Computer Fundamentals and Applications' is designed to make the student familiar with computer technology and its applications.

- Chapters 1 to 5 deals with the basics and concepts of computers technology Chapter 6 & 7 deals with the Operating System and Chapter 8 to 10 deals with the application of computers for office automation and Internet technology.
- The subject is expected to be taught as per the teaching scheme and weightage of marks allotted for topics in theory as well as practical.
- Chapters 6 to 10 should be covered during the practical sessions.

The students should be given maximum hands on practice to develop skills in operating computer systems and working with different application software. Assignments should be given on real time applications. More assignments can be given as per the availability of time. For effective teaching/learning it is expected that list of questions based on related topics may be given.



## **PRACTICAL**

**Practical Code : 200221 (22)**

**No. of Hours/Periods: 96**

### **LIST OF PRACTICAL / TUTORIALS:**

- Study of input and output devices
- Study of storage devices
- Practice on internal and external MS-DOS commands
- Practice on Windows 95/98/2000
  - Starting Windows, Exploring the desktop, Arranging windows, My Computer, The start button, Creating Shortcuts, Practice on moving and sizing of windows
  - Study of file organization: creating, copying, moving, renaming and deleting
  - Practice on Windows Accessories- Notepad, Word Pad and Paint
  - Editing document & formatting text, Previewing and printing document/Image file
  - Practice on Windows Explorer
  - Recycle bin
  - Shutting down windows
- Practice on MS-Word
  - Create and format document
  - Edit and Modify text- changing font size type and style
  - AutoText, AutoComplete, AutoCorrect, grammar and spellchecker, Find and replace of text
  - Open save and print a document
  - Insert, modify table
- Practice on Microsoft Excel
  - Create, save & format worksheet
  - Open and save worksheet file
  - edit & modify data
  - use formula and functions
  - split windows and freeze pans
  - Create, edit, modify, print worksheet/charts .
- Practice on PowerPoint

- Create, edit, insert, move, slides
- Open and save presentation
- Insert picture, slide layout, action button
- Present slide show
- Practice on:
  - Identification of type of Account.
  - Connecting to internet
    - Dial up access
      - Web browsing
    - Searching websites
    - Information searching
      - Email services
    - Creating email accounts & Receiving and sending mails

## LEARNING RESOURCES

### a) Reference Books

S.No.	Title	<i>Author</i> <b>Publisher &amp; Address, Edition</b> <b>Year</b>
1.	Introduction to Computers	Peter Norton's, Tata McGraw Hills Publishing Co.l Ltd. N. Delhi, Ind Edition, 1998
2.	The ABCs of Ms-Office 97	Gay Hart Davis, BPB Publications N. Delhi, Ist Edition 1996
3.	Computer Organization and Architecture	William Stalling, Prentice Hall of India Pvt.Ltd , N.Delhi, IV th - Edition, 1999
4.	Structured computer Organization	Andrews Tanenbaum, Prentice Hall of India Pvt.Ltd, N.Delhi, III rd- Edition, 1997
5.	Teach yourself.... Windows 95	AL Stevens Comer, BPB Publication, N.Delhi, I st – Edition, 1995
6.	The Internet Book	Douglas E., Prentice Hall of India Pvt.Ltd, N.Delhi, II – Edition, 2000
7	Computer Today	S.K.Basanbhara, Galgotia Publication, 1 st Edition, 2000

### b) Others

1. Lab manuals (if any)
2. CAI packages (if any)
3. OHP transparencies Models (if any)

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**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL  
UNIVERSITY, BHILAI,**

**SEMESTER : II**  
**COURSE TITLE : ENGINEERING DRAWING**  
**THEORY CODE : 200215 (37)**  
**BRANCH/DESCIPLINE : CIVIL/MECHANICAL/ELECTRICAL/METALLURGY/  
 INSTRUMENTATION/MINING/COMPUTER  
 SCIENCE  
 & ENGINEERING/  
 INFORMATION TECHNOLOGY**

Minimum number of class tests to be conducted: 2

**DISTRIBUTION OF HOURS & MARKS**

Chapter No.	Chapter Name	Hours	Marks
1.	INTRODUCTION	<u>6</u>	8
2.	DIMENSIONING TECHNIQUES & STANDARD CONVENTIONS	8	8
3.	ENGINEERING CURVES AND SCALES	8	8
4.	ORTHOGRAPHIC PROJECTIONS OF POINTS, LINES AND PLANES	<u>8</u>	10
5.	PROJECTION OF SIMPLE MACHINE PARTS AND COMPONENTS.	<u>8</u>	10
6.	<b>PROJECTION OF SOLIDS</b>	<u>10</u>	12
7.	<b>SECTION OF SOLIDS</b>	10	12
8.	<b>DEVELOPMENT OF SURFACES</b>	10	12
9.	<b>ISOMETRIC PROJECTIONS</b>	10	10
10.	<b>BASICS OF CAD</b>	18	10
	<b>Total</b>	<b>96</b>	<b>100</b>

**DETAILED COURSE CONTENTS**

Chapter –1: Introduction

- **Introduction to drawing equipments, instruments and their uses**
- **Planning of drawing sheet as per I.S. 696 – 1972**
- **Indian standard practices of laying out and folding of drawing**
- **Different types of lines used in engineering drawing**
- **Standard practice for writing single stroke vertical and inclined capital and lower cases letters (practice to be done on sketch book)**
- **Standard practice of writing numerals (practice to be done on sketch book)**

Chapter –2: Dimensioning techniques and standard conventions

- **Identification and representation of various symbols used in Mechanical and Electrical Drawing**
- **Drawing Identification and representation of various symbols of building elements, materials and sanitary fittings**
- **Principles, system and arrangement of dimensioning**
- **Practice problems of current method of dimensioning**

Chapter –3: Engineering curves and scales

- **Form associated with engineering curves**
- **Types of engineering curves**
- **Method of construction of Engineering Curves**
- **Practice problems of drawing various Engineering Curves.**
- **Importance of scale in Engineering drawing**
- **Types of scales- plain, diagonal etc.**
- **Practical problems for constructing various types of scale.**

Chapter –4: Orthographic projection of points, lines and planes

- **Definitions of various terms associated with orthographic projections.**
- **Planes of projections**
- **Concept of Quadrants**
- **First and third angle method of projection**
- **Projection of line in different positions with respects to H.P. V.P. and X-Y line**
- **Projection of planes in different position with respect to reference planes**
- **Practice problems on projection of points, lines and planes.**

Chapter –5: Projections of simple machine parts and components

- **Procedure for drawing projections and sectional views of simple machine components**
- **Practice problems of sketching and drawing the projections and sections of simple machine components.**

## Chapter –6: Projections of solids

- **Types of solids and associated terminology**
- **Position of solid with respect to reference planes**
- **Drawing projections of solid in different position with respect to reference planes**
- **Practice problems to draw projections of solid in different positions.**

## Chapter –7: Section of solids

- **Concept of sectioning planes**
- **Auxiliary planes and true shape of section**
- **Practice problems for drawing projections and section of solids.**

## Chapter –8: Development of surfaces

- **Concept and importance of surface development in engineering field**
- **Development of surfaces for the following**
  - **Cube**
  - **Cylinder**
  - **Prism**
  - **Cone and Frustum cone**
- **Practice problems.**

## Chapter –9: Isometric projections

- **Limitations of orthographic projections**
- **Definitions of the terms axonometric, oblique, Isometric and diametric projections**
- **Procedure for preparing isometric oblique**
- **Isometric view of geometrical solids and simple machine parts**
- **Practice problems.**

## Chapter –10: Basics of CAD

- **Computer hardware and software requirement for CAD**
- **Co-ordinate systems**
- **Set up for a CAD drawing**
- **Drawing objects like- Line, Circle, Arc, Ellipse, Regular Polygons, Polylines, Donuts etc.**

- **Editing Commands like- Move, Copy, Rotate, Scale, Fillet, Chamfer, Trim, Extend, Array, Mirror etc.**
- **Basic dimensioning, geometric dimensioning and tolerance**
- **Use CAD commands for simple orthographic and isometric drawings**

#### INSTRUCTIONAL STRATEGIES

- Lecture Method
- Demonstration and use of instrument used in drawing.
- Classroom practices for different typical exercises.
- Use of computer for developing drawing
- OHP Transparencies for complicated drawing objects

#### LIST OF TUTORIAL WORK

- Problems on Scales and Letterings (One sheet)
- Problems on Curves (One sheet)
- Simple Orthographic Projections- One for First Angle and One for Third Angle Projection (Two sheets)
- Orthographic projections with sections (One sheet)
- Isometric projection for two objects (One sheet)
- Projection of Points and Lines (One sheet)
- Projection of Planes (One sheet)
- Projection of Solids (Two sheets)
- Section of Solids (Two sheets)
- Development of surface (Two sheets)
- Use CAD for orthographic projection (Five problems)
- Use CAD for isometric projection (Three problems)

#### LEARNING RESOURCES

##### a) Reference Books

S.No.	Title	Author/Publisher
1.	I.S. 696. (Latest revision).	BIS, India
2.	Engineering Drawing	N.D. Bhatt, Charoter Publisher, Anand
3.	Engineering Drawing & Machine Drawing	R. K. Dhawan, Kumar
4.	Engineering Drawing	R.B. Gupta, Satya Prakashan, Delhi
5.	Geometrical Drawing	P.S. Gill, ketson & Sons
6.	Machine Drawing	By P.S. Gill, ketson & Sons
7.	Engineering Drawing	Gujral & Shende, Khanna Pub. N.Delhi

8.	Work Book in Mechanical Drafting	TTTI, Bhopal
9.	Engineering Drawing & Graphics Using AutoCAD 2000	T. Jeyapoovan, Vikas Publishing House Pvt. Ltd, New Delhi.

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**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL  
UNIVERSITY, BHILAI**

**SEMESTER : II**

**COURSE TITLE : BASIC NON-CONVENTIONAL ENERGY SOURCES LAB**  
**CODE : 200223 (37)**  
**BRANCH/DISCIPLINE : CIVIL/MIECH./ELECTRICAL/  
METALLURGICAL**

**DISTRIBUTION OF HOURS/PERIODS:**

There is no theory suggested in this course hence the following strategies may be implemented to provide effective practical exposure to the students. The total 20 marks are distributed in study visit, term work and seminar. The distribution of total 32 no. of periods/hours are given below-

<b>S. No.</b>	<b>Themes</b>	<b>No. of Periods/Hours</b>
1	<b>SOLAR ENERGY SYSTEMS</b>	8
2	WIND ENERGY SYSTEMS	8
3	BIO-MASS ENERGY	8
4	OVERVIEW OF OTHER RENEWABLE ENERGY SOURCES	8
	<b>TOTAL</b>	<b>32</b>

**INSTRUCTIONAL STRATEGIES:**

- **Industrial/field visit:** Visit to renewable energy development agencies, power plants, and other resource institutes in your state and nearby states of the country. Students should submit a report based on their observation during study visit.
- **Expert Lecture:** Suggestive list of themes are given below for organising the expert lectures-
  - Analysis of Solar energy potential in your state.
  - Domestic Solar cooker
  - Solar Refrigeration
  - Solar water heating system for the institute's building.
  - Analysis of wind energy potential in your state.
  - Latest developments in biogas handling, storage and scope for entrepreneur development.
  - Renewable Energy System Management.



## LIST OF PRACTICALS:

**Any one from each section (total 4 nos.)** of the *following list of practical work* can be given to the students for working on these and submission of report.

### Solar Energy Systems

- Study of different solar appliances-
  1. Solar Cooker
  2. Solar Drier
- Study of solar PV modules for 5 KW peak load of a residential house in stand-alone mode.
- Study of solar water heating system of 120 litre/day capacity for the institute's hostel.
- Study of Solar pump and calculate its discharge.
- Study of Solar street light system.

### Wind Energy Systems

- Study of constructional feature of different types of wind turbines & their applications.
- Planning the layout of a wind farm in the hilly terrain of your state.
- Preparation of checklist for maintenance of wind turbines.
- Feasibility study of wind driven water pump in the Institute for solving water scarcity.

### Bio-Mass Energy

- Construction details and working of different types of bio-gas plant.
- Specification and quantity of construction materials required for any one type of biogas plant with cost analysis.
- Study of domestic & Industrial applications of biogas.
- Procedure for maintenance of biogas plant
- Latest developments in biogas handling, storage and scope for entrepreneur development.

### Other Renewable Energy Sources

- Scope of Mini and Micro-hydro power plants in your state.
- Working principle of geothermal power plant.
- Present applications of hydrogen energy in India and abroad.
- Scope of tidal and ocean energy development in India.

## Seminar

The topic for the seminar should be given to the group of three students and they shall be asked to defend the seminar in presence of teacher and other students. Each student is required to defend the seminar individually. Any one seminar can be conducted for each group from the topics mentioned above in the list of practical work.

## LEARNING RESOURCES.

### (a) Reference Books :

S. No	Title	Author/ Publisher
1	Renewable energy: power for a sustainable future	Boyle G, /Oxford University Press
2	Bio gas Technology, A practical hand book	Khandelwal K.C.& Mehdiss/ Tata McGraw Hill Publishing Company Ltd. New Delhi
3	Renewable Energy	Island Press Earthscan/Kogan Page
4	Solar Energy System utilization	G.D Rai / R.K KhannaPublishers
5	Bio gas systems: Principles and application	Mittal K.M./New age International Ltd.New Delhi
6	Biogas Energy in India	Academic book centre Ahmedabad
7	Advances in Biogas technology	O.P Chawla / ICAR, New Delhi
8	Renewable energy sources and conversion technology	N.K Bansal, Manfred Kleemann, Michael Maliss/ Tata Mcgraw Hill Publishing Company Ltd. New Delhi
9.	Renewable energy: Environment and development	Dayal M./ Konark Publisher Pvt. Ltd.

10.	Institutional finance for renewable energy development in India	Sekhar R.C./ Urja Bharti
11.	Solar energy fundamentals and applications	H.P.Garg& J.Prakash/ Tata Mcgraw Hill Publishing Company Ltd.  New Delhi

**(b) Others:**

- VCDs.
- Learning Packages.
- Charts: developed by different agencies like M.P. Urja Vikas Nigam etc.

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**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL  
UNIVERSITY, BHILAI**

**SEMESTER** : **II**  
**SUBJECT TITLE** : **PROFICIENCY IN PROFESSIONAL  
ACTIVITY (PPA)**  
**CODE** : **200224 (46)**  
**BRANCH/DISCIPLINE** : **ALL DISCIPLINES**

**DISTRIBUTION OF MARKS AND HOURS:**

<b>Chapter No.</b>	<b>Chapter Name</b>	<b>No. of Hours/ Periods</b>	<b>Marks</b>
1	Presentation Skills	8	9
2	Learning To Learn Skills	3	5
3	Study Skills	3	5
4	Information Search	5	5
5	Time Management	3	5
6	Personality	5	5
7	Personal Grooming	5	6
<b>TOTAL</b>		<b>32</b>	<b>40</b>

**In this particular subject though it has been classified as practical, it maybe essential to take up certain theory classes and assignments this may include expert lectures, group discussion, plenary session etc.**

**DETAILED COURSE CONTENTS:**

*Chapter – 1* : **PRESENTATION SKILLS** :

Oral Presentation :

- Need of effective oral presentation.
- Characteristics of good oral presentation.
- Ways of Oral Presentation (Seminar, Viva-voce, Interview, Group Discussion, Lecturing, Power Point etc.)
- Gestures/Mannerism during oral presentation Media, methods used for effective oral presentation.
- Assessment of oral presentation.

**Written Presentation :**

- Need of written presentation.
- Characteristics of written presentation.

- Ways of written presentation (Report writing, manual, handout, notes etc.).
- Grammar, Punctuation, referencing paragraphing during written presentation.

**Chapter – 2 : LEARNING TO LEARN SKILLS :**

- Need of Learning to Learn Skills.
- Type of Learning Skills (Learning face to face, Individualized learning, Distance learning, Self-learning).
- Developing Learning to Learn Skills.

**Chapter - 3 : STUDY SKILLS :**

- Methods of Good Study Habits
- Note Taking
- Developing Reading Skills

**Chapter – 4 : INFORMATION SEARCH :**

- Objectives of information search.
- Ways of information search (Internet surfing, Library search, Abstracts, Journals, books etc.)
- Assimilation and presentation of information.

**Chapter – 5 : TIME MANAGEMENT :**

- Principles of Time Management.
- Time Management matrix.
- Criteria governing Time Management.
- Possible time waster

**Chapter- 6 : PERSONALITY :**

- Concept and meaning of personality
- Characteristics of good personality
- Factors influencing personality
- Types of personality.
- .Need for desirable personality for success
- Qualities of complete personality.

*Chapter - 7 PERSONAL GROOMING:*

- Posture and Health.
- Types of posture.
- Importance of posture.
- Factors affecting good health-diet, exercise personal cleanliness, sleep and rest.

- Use of cosmetics.
- Dress Code
- Physical Fitness and Inner Strength

**INSTRUCTIONAL STRATEGIES:**

- Lecture Method.
- Industrial visits.
- Expert Lecture.
- Demonstration
- Assignments-Individual and Group
- Group Discussions
- Presentation

**LIST OF PRACTICALS**

- Seminar Presentation on Specific topic for fixed time duration
- Information Collection on a particular topic followed by presentation in specified time duration.
- Visit to multinational outlet for observing personality traits of officials and preparing detailed report
- Demonstration exercise by personality experts
- Guest lectures by well known personality

**LEARNING RESOURCES:**

**(c) Reference Books**

<b>Sl. No.</b>	<b>Title</b>	<b>Author, Publisher, Edition &amp; Year</b>
1	How to achieve success and happiness	Sultan Chand and Sons, New Delhi
2	How to develop effective personality	Dr Mittal and Agarwal CS
3	The Art of Public Speaking	Stephen E Lucas
4	Public Speaking and Influencing Business	Dale Carnegie

**(b) Others:**

- Video Programs.
- Learning Packages.
- Computer with internet facilities
- Television
- Charts.

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