



**Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore**  
**Program Name: Diploma**

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
DTMA201	BS	<b>APPLIED MATHEMATICS II</b>	60	20	20	0	0	3	1	0	4

**Course Objective**

*To introduce the students with the Fundamentals of the Engineering Mathematics.*

**Course Outcomes**

*After the successful completion of this course students will be able to:*

- 1. understand the concept of limit, continuity, and differentiability and find maxima, minima and critical points of functions.*
- 2. solve the system of simultaneous linear equations using matrices and determinants*
- 3. apply partial derivatives and 3D geometry to Engineering problems*
- 4. understand different techniques of Integral and apply definite integral to find area and learn various methods of solving linear differential equations of first order.*
- 5. construct and solve the problems by differential equations and integration.*

**Course Content:**

**Unit 1**

FUNCTION, LIMIT, CONTINUITY & DIFFERENTIABILITY: Function, Definitions of variables, constants, open & closed intervals. Definition & types of functions – Simple Examples, Limits, Concept & definition of Limit. Standard limits of algebraic, trigonometric, exponential and logarithmic functions. Evaluation of limits. Continuity, Definition and simple problems of continuity. DERIVATIVE: Definition of Derivatives, notations. Derivative of standard functions. Rules for differentiation in case of sum, difference, product and quotient of functions. Derivative of composite functions (Chain

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DTMA201	BS	<b>APPLIED MATHEMATICS II</b>	60	20	20	0	0	3	1	0	4

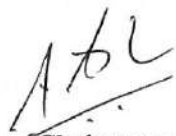
rule). Derivatives of inverse trigonometric functions. Derivatives of implicit functions. Logarithmic derivatives. Derivatives of parametric functions. Derivative of one function with respect to another function, Second order derivatives. Applications of Derivatives. Geometric meaning of derivative. Rate measurement, Maxima & Minima (one variable).

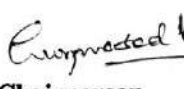
### Unit 2

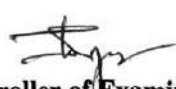
**MATRICES & DETERMINANTS:** Define matrix and its representation state its order. State types of matrices with examples. Perform Addition, subtraction and multiplication of a matrix with a scalar and multiplication of two matrices (upto third order only). Transpose, Adjoint and Inverse of a matrix upto third order. Solution of simultaneous equations by matrix method (linear equations in two and three unknowns). Problems on above, **DETERMINANTS:** Define determinant (second and third order). Minor, CO-factor, Study properties of determinants. Cramer's Rule: (solutions of simultaneous equations of two and three unknown).

### Unit 3

**PARTIAL DIFFERENTIATION & ANALYTICAL GEOMETRY IN THREE DIMENSIONS:** Functions of several variables. Partial derivatives up to three independent variables, Maxima & Minima, Euler's Theorem on homogenous function for two variables. **ANALYTICAL GEOMETRY IN THREE DIMENSIONS:** Co-ordinates of a point in rectangular co-ordinate system, Distance formula, Division formula, Dcs & Drs of a line, the formula for angle between two lines with given Drs, conditions of perpendicularity and parallelism. State equation of a plane, Find equation of a plane in different forms (i) General form  $Ax+By+Cz+D=0$ , where A,B,C are Drs of the normal to the plane, (ii) Intercept form  $(X/a+Y/b+Z/c=1)$ , (iii) Normal form, Angle between two planes, Perpendicular distance from a point to a plane.

  
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DTMA201	BS	<b>APPLIED MATHEMATICS II</b>	60	20	20	0	0	3	1	0	4

**Unit 4**

INTEGRAL CALCULUS: Integration as inverse process of differentiation. Indefinite and Definite Integral, Integrals of standard functions, Methods of Integration (i) Integration by Decomposition of Integrand, (ii) Integration by Substitution, (iii) Integration by parts, Methods of Integration by partial fraction. Definite Integrals, Properties of Definite Integrals. Area bounded by the curve  $y=f(x)$ ,  $x=a$ ,  $x=b$  and  $x$ -axis and the area bounded by the curve  $x=f(y)$ ,  $y=c$ ,  $y=d$  and  $y$ -axis.

**Unit 5**


DIFFERENTIAL EQUATION: Differential equation, Order and degree of a differential equation, Formation of first order first degree differential equation. Solution of first order and first-degree differential equation by the following methods (i) separation of variables (ii) Linear

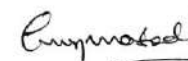
**Text Books:**

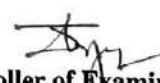
1. A. Sarkar, Mathematics (First Semester), Naba Prakashani
2. G.P. Samanta, A Text Book of Diploma Engineering Mathematics, Volume-1, Learning Press
3. Dr. S. Bose & S. Saha, A Complete Text Book of Mathematics, Lakshmi Prakasan

**Reference Books:**

1. H.S. Hall & S.R. Knight, Higher Algebra Book Palace, New Delhi
2. S.L. Loney, Trigonometry S. Chand & Co.
3. H.K. Dass Engineering Mathematics S. Chand & Co.
4. T.M. Apostol Calculus, Volume-1, John Wiley & Sons
5. B.K. Pal, K. Das, Engineering Mathematics, Volume-1, U.N. Dhar & Sons
6. B.C. Das & B.N. Mukherjee, Differential Calculus U.N. Dhar & Sons
7. KAR, Engineering Mathematics, Tata McGraw- Hill
8. SINGH, Engineering Mathematics Tata McGraw- Hill.

  
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# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## Shri Vaishnav Institute of Science

### Name of Program: Diploma (All Streams)

(2021-2025)

COURSE CODE	CATE- GORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTCH101	Diploma	Engineering Chemistry	60	20	20	30	20	2	1	2	4

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit;

\*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

### Course Educational Objectives (CEOs):

To impart a sound knowledge on the principles of chemistry involving the different application-oriented topics required for all diploma engineering branches.

1. To understand the boiler related problems and treatment of hard water for industries and power plants.
2. To acquire the knowledge about the properties of engineering materials, lubricants and fuels.
3. To understand the electrochemical reactions and significance of corrosion control to protect the structure.
4. To acquaint the students with practical knowledge of the basic concepts of chemistry.

### Course Outcomes (COs):

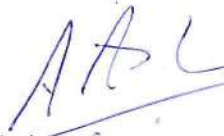
Students will:


1. Understand the properties of water and the importance of its treatment for portable and industrial purposes.
2. They will understand the basic properties of engineering materials, lubricants and fuels
3. To make the students understand the principles and electrochemical reactions involved in corrosion and methods to control corrosion.
4. They can predict the potential applications of chemistry and practical utility to become a good engineer.


### Syllabus

#### Unit-I Water: Characteristics and Treatment

Sources, Impurities, Hardness & its units, Industrial water characteristics, softening of water by various methods (Exrernal & Internal treatment), Boiler trouble causes, effects & remedies, Characteristics of municipal water & its treatment.

  
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**Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore**  
**Shri Vaishnav Institute of Science**  
**Name of Program: Diploma (All Streams)**  
**(2021-2025)**

(2021-2025)											
COURSE CODE	CATE-GORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTCH101	Diploma	Engineering Chemistry	60	20	20	30	20	2	1	2	4

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### Unit-II Lubricants

Introduction, Mechanism of lubrication, Classification of lubricants, Properties and Testing of lubricating oils.

### Unit-III Fuels

Introduction, Definition and classification of fuels, Characteristics of a good fuel, Calorific value, Determination of calorific value by Bomb calorimeter, Proximate and Ultimate analysis of coal and their significance, Carbonization, Cracking of higher Hydrocarbons and its advantages, Knocking, Cetane number, Octane Number.

### Unit-IV Electrochemistry and Corrosion

Arrhenius theory of electrolytic dissociation, Transport number, Kohlrausch's law, Electrochemical cells.

Introduction and economic aspects of corrosion, Dry or Chemical Corrosion, Wet or Electrochemical Corrosion, Prevention methods of corrosion.


### Unit-V Engineering Materials


Engineering materials and their classification: Refractories, Cement, Polymers. Properties and applications.

### References

1. Engg. Chemistry- Rath cengage learning.
2. Applied Chemistry – Theory and Practice, O.P. Viramani, A.K. Narula, New Age Pub.  
Chemistry for Environmental Engineering – Sawyer, McCarty and Parkin –McGraw Hill, International.
3. Basic Lubrication theory – Alistair Cameron

  
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## Shri Vaishnav Institute of Science

### Name of Program: Diploma (All Streams)

(2021-2025)


COURSE CODE	CATE-GORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTCH101	Diploma	Engineering Chemistry	60	20	20	30	20	2	1	2	4

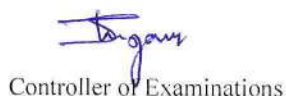
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4. Engineering chemistry- Dr. Jyoti Mitna
5. Engineering chemistry- Dr. Sunita Ratan
6. Applied Chemistry – S.M. Khopkar
7. Introduction of polymer science- G.S. Mishra

  
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**Shri Vaishnav Institute of Technology and Science**  
**Choice Based Credit System (CBCS) in the light of NEP-2020**  
**Diploma in Civil Engineering**  
**(2021-2024)**

COURSE CODE	CATEG ORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTCE 101	BEC	Applied Mechanics	60	20	20	30	20	2	1	2	4

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**Course Educational Objectives (CEOs):**

The students (A) will be Able to familiarize with different branches of mechanics (B) with emphasis on their analysis and application to practical engineering problems(C) efficiently & effectively (D)

**Course Outcomes (COs):**

The students will be able to

1. To apply knowledge of mathematics, science in engineering.
2. To identify, formulate, and solve engineering problems.
3. Demonstrate various types of forces and their analysis.
4. Demonstrate shear force and bending moment on structural member.
5. Demonstrate centre of gravity and moment of inertia determination of different geometrical shapes.

**Syllabus:**

**UNIT I**

**05 Hrs.**

**Static and Dynamic Forces:** Introduction to Engineering Mechanics; Classification of Engineering Mechanics; Statics, Dynamics, Kinematics, Kinetics etc.; Fundamental Laws of Mechanics.

**UNIT II**

**06 Hrs.**

**Law of Forces:** Force, Pressure and Stress; Free body diagram; Bow's Notation; Characteristics and effects of a force; System of forces, Resolution of a force, Composition of forces, Resultant / equilibrant force; Law of Parallelogram of Forces, Law of Triangle of Forces, Polygon Law of Forces; Lami's Theorem, Equilibrium of a Body Under Two/ Three/More than Three Forces; Law of Superposition of Forces.

**UNIT III**

**06 Hrs.**

**Analysis of Framed Structure:** Analysis of Framed Structure: Frame, Types of frames; Truss, Types of trusses, Analysis of Truss; Various methods of Analyzing the truss; Numerical analysis of truss.



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**Shri Vaishnav Institute of Technology and Science**  
**Choice Based Credit System (CBCS) in the light of NEP-2020**  
**Diploma in Civil Engineering**  
**(2021-2024)**

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**UNIT IV**

**06 Hrs.**

**Centre of Gravity:** Centroid; Centre of Gravity; Determination of Centroid of Simple Figures; Centroid of Composite Sections; Centre of Gravity of Solid Bodies.

**Moment of Inertia:** Basic Concept of Inertia, Definition of Moment of Inertia, Theorems of Moment of Inertia and Radius of Gyration.

**UNIT V**

**07 Hrs.**

**Beams:** Types of Beams, Simply Supported Beam, Overhanging Beam, Cantilever Beam; Types of supports of a beam or frame: Roller, hinged and fixed supports; Load on the beam; Different types of loading; Support reaction of a beam for point and uniformly distributed load; Shear force and bending moment for simply supported beam for point and uniformly distributed load.

**Textbooks:**

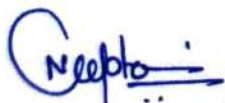
1. Prasad I.B., Applied Mechanics, Khanna Publication
2. R.S. Khurmi, N. Khurmi, A Textbook of Engineering Mechanics, S Chand Publishing.
3. R.K. Rajput, A Textbook of Applied Mechanics, Laxmi Publications

**Reference Books:**

1. S.P. Timoshenko, Engineering Mechanics, McGraw Hill Education.
2. R.C. Hibbler, Engineering Mechanics: Statics & Dynamics, Pearson Education
3. A. Boresi & Schmidt, Engineering Mechanics- statics dynamics, Thomson Books

**List of Practical's:**


1. To verify the law of Triangle of forces
2. To verify the Lami's theorem.
3. To verify the law of parallelogram of forces.
4. To verify law of polygon of forces
5. To determine support reaction and shear force at a given section of a simply Supported beam and verify in analytically using parallel beam apparatus.
6. To determine the moment of inertia of fly wheel by falling weight method.
7. To verify bending moment at a given section of a simply supported beam.
8. Study of Various Beams and their Loading conditions



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## Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

### ML307 ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY

SUBJECT CODE	CATEGOR Y	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assesse nt*	END SEM University Exam	Teachers Assesse nt*				
ML-307	Compulsory	Environmental Management and Sustainability	60	20	20	0	0	4	0	0	4

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit;

**\*Teacher's Assessment** shall be based upon following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

#### Course Objective

1. To create awareness towards various environmental problems.
2. To create awareness among students towards issues of sustainable development.
3. To expose students towards environment friendly practices of organizations.
4. To sensitize students to act responsibly towards environment.

#### Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of five questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

#### Course Outcomes

1. The course will give students an overview of various environmental concerns and practical challenges in environmental management and sustainability.
2. Emphasis is given to make students practice environment friendly behavior in day-to-day activities.

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## COURSE CONTENT

### Unit I: Introduction to Environment Pollution and Control

1. Pollution and its types (Air, Water, and Soil): Causes, Effects and Control measures
2. Municipal Solid Waste: Definition, Composition, Effects
3. Electronic Waste: Definition, Composition, Effects
4. Plastic Pollution: Causes, Effects and Control Measures

### Unit II: Climate Change and Environmental Challenges

1. Global Warming and Green House Effect
2. Depletion of the Ozone Layer
3. Acid Rain
4. Nuclear Hazards

### Unit III: Environmental Management and Sustainable Development

1. Environmental Management and Sustainable Development: An overview
2. Sustainable Development Goals (17 SDGs)
3. Significance of Sustainable Development
4. Environment Friendly Practices At Workplace and Home (Three Rs' of Waste Management, Water Conservation, Energy Conservation)

### Unit IV: Environmental Acts

1. The Water (Prevention and Control of Pollution) Act, 1974: Objectives, Definition of Pollution under this act, Powers and Functions of Boards
2. The Air (Prevention and Control of Pollution) Act, 1981: Objectives, Definition of Pollution under this act, Powers and Functions of Boards
3. The Environment (Protection) Act, 1986: Objectives, Definition of important terms used in this Act, Details about the act.
4. Environmental Impact Assessment: Concept and Benefits

### Unit V: Role of Individuals, Corporate and Society

1. Environmental Values
2. Positive and Adverse Impact of Technological Developments on Society and Environment
3. Role of an individual/ Corporate/ Society in environmental conservation
4. Case Studies: The Bhopal Gas Tragedy, New Delhi's Air Pollution, Arsenic Pollution in Ground Water (West Bengal), Narmada Valley Project, Cauvery Water Dispute, Fukushima Daiichi Disaster (Japan), Ozone Hole over Antarctica, Ganga Pollution, Deterioration of Taj Mahal, Uttarakhand flash floods

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### Suggested Readings:

1. Rogers, P.P., Jalal, K.F., Boyd, J.A. (Latest Edition). **An Introduction to Sustainable Development.** Earthscan
2. Kalam, A.P.J. (Latest Edition). **Target 3 Billion: Innovative Solutions Towards Sustainable Development.** Penguin Books
3. Kaushik, A. and Kaushik (Latest Edition). **Perspectives in Environmental Studies.** New Delhi: New Age International Publishers.
4. Dhameja, S.K. (Latest Edition). **Environmental Studies.** S.K. Kataria and Sons. New Delhi
5. Bharucha, E. (Latest Edition). **Environmental Studies for Undergraduate Courses.** New Delhi: University Grants Commission.
6. Wright, R. T. (Latest Edition). **Environmental Science: towards a sustainable future.** New Delhi: PHL Learning Private Ltd.
7. Rajagopalan, R. (Latest Edition). **Environmental Studies.** New York: Oxford University Press.

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Think Excellence. Live Excellence.

## DIPLOMA SEMESTER II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
DTHU101		COMMUNICATION SKILLS	0	0	0	30	20	0	0	4	2

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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### Course Educational Objectives (CEOs):

A diploma holder is supposed to (A) write official, business and personal letters. (B) Technical report writing forms another activity of diploma holders. (C) Keeping in view, the above and continuing education needs of diploma holders, communication skill has been considered as essential human science subject. (D) The emphasis of teaching should be to develop necessary competencies (knowledge and skill) in written and oral communication in English.

### Course Outcomes (COs):

## Syllabus

### UNIT-I

#### Prose (Text book) writing in English:

1. Introduction to communication skills in English language.
2. Concept, principle and procedure for prose selection.
3. Study and practice in English prose as recommended in the prescribed book (5-lessons)

### UNIT-II

#### Correspondence in English: Official, Business & Personal Letters:

1. Introduction and understanding of writing letters in English.
2. Concept, principle and procedure in writing official letters.
3. Concept, principle and procedure in writing business letters.

  
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## **Diploma in Mechanical Engineering SEMESTER II**

4. Concept, principle and procedure in writing personal letters.
5. Classification of text of letters as Title, Body and closing procedure.

### **UNIT – III**

**English Grammar:** Basic Language Skills: Grammar and usage- Types of sentences, Phrases and Clauses; Parts of Speech; Direct-Indirect; Active-Passive voice; S-V Agreement, Tenses.

### **UNIT – IV**

**Communication Techniques:** All forms of written communications including drafting reports; notices, agenda note, business correspondences, preparation of summaries and précis; telegrams, circulars and Telephonic communications.

### **UNIT – V**

#### **Precis and Comprehension:**

1. Introduction and understanding of writing precis in English.
2. Concept/ principle or procedure for precis writing.
3. Organizing and summarizing the selected paragraph to develop scheme in precis writing.
4. Textbook prescribed by State Board of Technical Education to be followed.

#### **Reference Books:**

1. *TTTI- Chandigarh, A Book of English for Polytechnic, Pros Selection. MacMillan, India.*
2. *Krishna Mohan and Meera Banerjee. Developing Communication Skills. MacMillan, India.*
3. *N. K. Aggarwal. Better English Grammar & Composition. Arnold Publication, New Delhi.*
4. *Thomas Huckin and Leslie Olson. Technical Writing and Professional Communication. McGraw Hill, New Delhi.*
5. *R K Bansal and J B Harrison. Spoken English for India. Orient Longman, New Delhi.*

  
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**Choice Based Credit System (CBCS)**  
**Diploma in Civil Engineering**  
**(2021-2024)**

COURSE CODE	CATEG ORY	COURSE NAME	TEACHING &EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTCE 203	DCC	Computer Proficiency	0	0	0	30	20	0	0	4	2

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit.

**\*Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

**Course Educational Objectives (CEOs):**

The students will be able to

1. Identify Computer Hardware Components, Network Components and Peripherals
2. Explain the role of an Operating System.
3. Perform fundamental tasks common to most application software

**Course Outcomes (COs):**

The student will be able

1. Use Word Processing Software to prepare document.
2. Use Spreadsheet Software to create workbooks and automate calculation.
3. Use Presentation Software to create interactive presentation.
4. Find and evaluate information on the Web.

**Syllabus:**

**List of Practicals:**

1. Identify various components, peripherals of computer and list their functions.
2. E-Mail ID creation, comparing, sending, and receiving e-mail, attaching a file with email message.
3. Word Processing (MS Office/Open Office) - File Management, Page set up, editing a document, Formatting a document, Tables and Borders
4. Spread Sheet Processing (MS Office/Open Office/Libre Office)- - File Management, Menu commands, Workbooks, creating a chart, Retrieve data with query, Exchange data with other application.
5. PowerPoint Presentation (MS Office/Open Office/Libre office)- Introduction to PowerPoint, Addition, deletion and saving of slides, Insertion of multimedia elements, Formatting slides.

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6. Google Suits - Using Google drive, Google shut, Google docs, Google slides.
7. Internet Basics of Networking – LAN, WAN, Wi-Fi technologies, Concept of IP Addresses, DNS, Search Engines, e-mail, Browsing and cyber laws.

**Textbooks:**

1. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Information Technology for Management by Henery Lucas, Tata McGraw Hills, New Delhi
3. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi.

**Reference Books:**

1. Fundamentals of Information Technology by Leon and Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
2. Internet for Everyone by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi 10.
3. Fundamentals of Information Technology by Vipin Arora, Eagle Prakashan, Jalandhar

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