Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Diploma in Mechanical Engineering

SEMESTER II

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
DTMA201N		APPLIED MATHEMATICS-II	60	20	20	0	0	3	0	0	3

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 20 marks.

Course Educational Objectives (CEOs):

To introduce the students to the fundamentals of Engineering Mathematics.

Course Outcomes (COs):

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

1. Understand the concept of determinant and matrices.
2. Know the fundamental concept of coordinate geometry.
3. Understand the concept of differential calculus.
4. Know the fundamental principle of vector algebra.

Syllabus

Unit - 1

Determinant: Introduction, Minor and Cofactors, Study properties of determinants, Applications of Determinants (Area of Triangle and Crammer's rule).

Unit – II

Matrices: Introduction, Types of matrices, Addition and subtraction of matrices, Scalar multiplication of matrices, multiplication of matrices, adjoint of a matrix.

Unit – III

Coordinate Geometry: Introduction, Distance formula of two points, section formula, Area of a triangle, condition for collinearity, Equation of straight line (slope intercept form, point slope form, two point slope form), angle between two straight lines.

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Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Diploma in Mechanical Engineering

SEMESTER II

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM	MST	Q/A	END SEM	Q/A				
DTMA201N		APPLIED MATHEMATICS-II	60	20	20	0	0	3	0	0	3

Unit – IV

Differentiation: Introduction, Fundamental rule for differentiation, differential coefficient of product of two functions, differential coefficient of quotient of two functions.

Unit – V

Vector Algebra: Concept of vector and scalar quantities, different types of vectors, addition of vectors, subtraction of vectors, multiplication of vectors (dot and cross product), applications.

Reference Books:

1. *B.K. Paul, Diploma Engineering Mathematics (Vol-1), U.N. Dhār & Sons*
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*
4. *H.S. Hall & S.R. Knight, Higher Algebra Book Palace, New Delhi*
5. *S.L. Loney, Trigonometry S. Chand & Co.*
6. *H.K. Dass Engineering Mathematics S. Chand & Co.*
7. *B.K. Pal, K. Das, Engineering Mathematics, Volume-1, U.N. Dhar& Sons*
8. *B.C. Das & B.N. Mukherjee, Differential Calculus U.N. Dhar& Sons*

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Shri VaishnavVidyapeethVishwavidyalaya, 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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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.

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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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.

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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Choice Based Credit System (CBCS) in the light of NEP-2020
Diploma
(2024-2027)

COURSE CODE	CATEGORY	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

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 (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 centre of gravity and moment of inertia determination of different geometrical shapes.

Syllabus:

UNIT I **08 Hrs.**

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

UNIT II **09 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 **09 Hrs.**

Analysis of Truss Structure: Introduction to Truss system, Types of trusses, Analysis of Truss using Joint Method.

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COURSE CODE	CATEGORY	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

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.

UNIT IV **09 Hrs.**

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

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

UNIT V **09 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.

Textbooks:

1. Engineering Mechanics, K.K Dwivedi, Dhanpat Rai Publications Pvt Ltd. 2020
2. Engineering Mechanics, Bhankar Bharat Gokaldas,Vandana Somkuwar, Khanna Book Publishing, 2021
3. A Textbook of Engineering Mechanics, R.S. Khurmi, N. Khurmi, S Chand Publishing, 2018.

Reference Books:

1. A Textbook of Applied Mechanics, R.K. Rajput, Laxmi Publications, 2016.
2. Engineering Mechanics, S.P, Timoshenko, Engineering Mechanics, McGraw Hill Education.
3. Engineering Mechanics: Statics & Dynamics, R.C. Hibbler, Pearson Education.

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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Choice Based Credit System (CBCS) in Light of NEP-2020
Diploma in Civil Engineering
(2024-2027)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTCE202N	DCC	Geology in Engineering	60	20	20	30	20	3	0	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):
The students will be able to understand, use and apply knowledge of geological processes and features to point out the risks & threats arising due to construction of structures at geologically unsuitable sites efficiently and economically.

Course Outcomes (COs):
The students should be able to:

1. Discuss on engineering problems related to Geological features and processes.
2. Suggest use of geological materials for construction.
3. Analyse suitability of structures at a particular site.
4. Interpret future impacts of construction of any structure at a site.

Syllabus:

UNIT I **8 hrs.**

Physical Geology: Introduction to Geology, Importance of Geology in Growth & development; Physical Geology: Nebular hypothesis of Origin of Earth, Layers and internal structure of Earth, Basic concepts of Continental Drift, Plate-Tectonics, Earthquake, Volcanoes, Weathering. Erosional processes & features, Soil formation, Soil Profile and Geological classification of Soil.

UNIT II **7 hrs.**

Mineralogy: Definition of Minerals, Physical Properties of Minerals, Origin of Minerals, Study of Common rock forming Minerals, Quartz, Chert, Jasper, Flint, Agate, Orthoclase, Plagioclase, Biotite. Study of Common Ore Minerals Hematite, Chromite, Bauxite, Pyrite, Galena and Study of minerals of economic importance to civil engineering Calcite, Gypsum, Feldspars.

UNIT III **8 hrs.**

Petrology: Constituents of Earth's Crust, General characteristics and types of Igneous, Sedimentary and Metamorphic Rocks. Study & Importance of some common types of rocks i.e., Granite, Basalt, Sandstone, Limestone, Shale, Slate, and Marble in Civil Engineering.

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Choice Based Credit System (CBCS) in Light of NEP-2020
Diploma in Civil Engineering
(2024-2027)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTCE202N	DCC	Geology in Engineering	60	20	20	30	20	3	0	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.

UNIT IV **7 hrs.**

Structural Geology: Important terms related to Structural Geology. Orientation of rock layers in the Earth's crust. Elementary knowledge of geological structures. Basic types, terminologies, and significance of folds, faults, joints and unconformities.

UNIT V **9 hrs.**

Applied Geology: Introduction to applied geology and its use in Civil Engineering, Engineering properties of rocks, Preventive measures taken while selecting sites for roads, bridges, dams, reservoirs and tunnels, Hydrological properties of rocks - Aquifer, Aquiclude, Aquifuge, Aquitard & artesian wells.

Textbooks:

1. Physical and Engineering Geology, S.K. Garg, Khanna Publishers, Delhi. 2018
2. A textbook of Geology, P.K. Mukerjee, Word press, 2020
3. A textbook of Geology, G.B. Mahapatra, New Central Book Agency (India) 2021

Reference Books:

1. Engineering and General Geology Prabin Singh, S K Kataria & Sons, 2021
2. Parthasarathy- "Engineering Geology" PHI Learning Pvt. Ltd., 2022
3. K.M. Banger "Engineering Geology", Dhanpat Rai & Co. 2020

List of Practical:

1. Identification of Physical features of the Earth.
2. Internal structure of Earth.
3. Continental drift map.
4. Plotting of Tectonic plates on map of world based on Plate tectonics theory.
5. Basic processes and features of earthquake.
6. Basic processes and features of Volcanism.
7. River basin map of India.
8. Identification of Minerals.
9. Identification of Rocks.
10. Identification of Structural features of Rocks.

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Choice Based Credit System (CBCS) in Light of NEP-2020
HUMANITIES
For Diploma (Engineering all branches)

Semester II

COURSE CODE	CATEGORY	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*				
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;
*__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

- **CEO1** Learn the different nuances of communication.
- **CEO2** Understand the features of listening and reading skills.
- **CEO3** Develop competency in professional communication.
- **CEO4** Study the essential aspects of effective written communication through Business letters and email writing for professional success.
- **CEO5** re-engineer their attitude and understand its influence on behaviour.

Course Outcomes (Cos): The students will be able to

- **CO1** Develop a comprehensive understanding of the theoretical and practical aspects of communication.
- **CO2** Understand and the different aspects of listening and reading**.**
- **CO3** Demonstrate different strategies for using professional communication skills
- **CO4** Draft effective business correspondence (letters) with brevity and clarity depending on the various prescribed formats.
- **CEO5** acquire communication, Problem solving skills, Negotiation and Time management skills

COURSE CONTENTS:

UNIT I
Introduction to LSRW skills, Art of Communication, Basic Soft skills, Body Language at workplace.

UNIT II
Reading Comprehension:
Short Stories: 1. A Letter to God 2. An Astrologer's Day

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HUMANITIES
For Diploma (Engineering all branches)
Semester II

COURSE CODE	CATEGORY	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*				
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;
*__Teacher Assessment__ shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT III
Interviewing Skills –Role of Interviewer and Interviewee, Types of interviews, Types of Interview Questions

UNIT IV
Business Correspondence: Business Letter, Parts & Layouts of Business Resume and Job application, E-mail writing.

UNIT V
Problem Solving, Negotiation Skills, Time Management, Anger and Stress Management.

Suggested Readings

- Ashraf Rizvi.(200**5).** *Effective Technical Communication*. New Delhi: Tata Mc Graw Hill
- Adair, John (2003). Effective Communication. London: Pan Macmillan Ltd.
- A.J. Thomson and A.V. Martinet(1991).*A Practical English Grammar*(4th ed). Newyork: Oxford IBH Pub.
- Fuentes,G.L. (2020). A Letter to God. First Flight. CBSE,.
- Kratz, Abby Robinson (1995). Effective Listening Skills. Toronto: ON: Irwin Professional Publishing.
- Narayan, R.K. An astrologer's Day. (1994).The Astroloers Day and other stories, Penguin Books,
- Prasad, H. M.(2001*) How to Prepare for Group Discussion and Interview*. New Delhi: Tata McGraw-Hill.
- Pease, Allan. (1998).*Body Language*. Delhi: Sudha Publications.