

MANDSAUR UNIVERSITY, MANDSAUR
By-pass Square, Rewas Dewra Road, SH-31, Mandsaur (M.P.)- 458001

DEPARTMENT OF ALLIED SCIENCES
MAT 070 Engineering Mathematics-I
Syllabus to be offered at Polytechnic Diploma Sem - I

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Course Objective:

- To provide the students with sufficient knowledge in Linear algebra, Statistics and Trigonometry that can be used in their respective fields.
- To provide detailed of matrices which is applied for solving system of linear equations and useful in various fields of technology.
- Students understand how trigonometric functions relate to right triangles and solve word problems involving right triangles.
- Applications of the formula of AP to solve daily life problems.
- To impart the knowledge of Statistics.

Course Outcomes:

On completion of course the students are able:		
COs	COs statements	Bloom's Level
CO1	Understand the basics of matrices and determinants and apply the knowledge of matrices to solve the problems.	Understand, Apply
CO2	Understand the basic concept of angles, triangles and trigonometric ratios and use right triangles to evaluate the six trigonometric functions.	Understand, evaluate
CO3	Apply the concepts of algebra to solve engineering related problems.	Apply, Analyze
CO4	Analyze statistical data using measures of central tendency and evaluate the measure of dispersion.	Analyze, Evaluate
CO5	Apply the binomial theorem to expand a binomial of any n th power, and evaluate expressions and equations involving binomials and combinations (and/or factorials).	Apply, Analyze, Evaluate

Articulation Matrix

(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSO. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation).

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	3	2	1	2	-	1	1	1	1	2	1	1	-
CO2	3	2	1	1	-	1	1	-	-	2	1	1	-
CO3	2	3	2	2	-	1	1	1	1	2	1	1	1
CO4	1	3	2	2	-	1	1	-	1	2	1	1	1
CO5	1	3	2	2	-	1	1	-	1	2	1	1	-

High-3 Medium-2 Low-1

Unit-I Matrix and Determinant

Definition, Types of Matrix, Operation on Matrix, Adjoint of a Matrix, Inverse of a Matrix.
Concept & Principles of Determinants, Properties of Determinants.

12 Hours

Unit-II Trigonometry

Allied angles, Trigonometrical ratios of sum and difference of angles, (Only statement), Sum and difference of trigonometric ratios (C- D formula), Multiple angles (Only double angle and half angle), Properties of triangle (without proof).

12 Hours

Unit-III Algebra

Arithmetic Progression, its n th term and sum of n terms with their applications to engineering problems. Geometrical Progression, its n th term and sum of n terms and to infinity with application to engineering problems, Partial fractions, Complex numbers.

12 Hours

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Unit-IV Statistics

12 Hours

Measures of Central tendency (Mean, Mode, Median), Measures of Dispersion (Mean deviation, standard deviation)

Unit-V Binomial Theorem and Permutation

12 Hours

Statement of the theorem for positive integer General term, Middle term, Constant term, Binomial theorem for any index (expansion without proof only), First and second Binomial approximation with application to engineering problems, Meaning of factorial n . Permutation of 'n' dissimilar thing taken 'r' at a time
Combination: Combination of n dissimilar things taken 'r' at a time

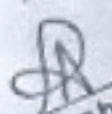
Total: 60 Hours

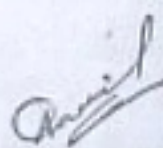
References

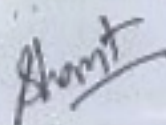
1. Engineering Mathematics (M.P. Hindi Granth Akadami) Dr. S.K. Chouksey & Manoj Singh.
2. Mathematical Statistics, Ray and Sharma.
3. Higher Engineering Mathematics, B.S. Grewal Khanna Publication.

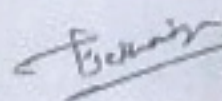
List of e-Learning Resources:

1. <https://nptel.ac.in/>
2. <https://www.coursera.org/>
3. https://www.edx.org/course/precaculus?index=product&queryID=e3c274000408d4939b01362a44d9a661&position=1&search_index=product&results_level=first-level-results&term=Trigonometry%09&campaign=Precaculus&source=edX&product_category=course&placement_url=https%3A%2F%2Fwww.edx.org%2Fsea
4. https://www.youtube.com/watch?v=KaLA1cWhQIA&list=PLLy_2iUCG87BLK18e1Se1fHKdE2_j2B_T


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Department of Mathematics
Mandsaur University, Mandsaur (458001)

CHE020 Engineering chemistry
Syllabus to be offered at Diploma EEE Sem - I

L	T	P	C
3	1	2	5

Course Objective:

- The purpose of this course is to emphasize the relevance of fundamentals and applications of chemical sciences in the field of engineering.
- The focus is more on the application of the basic concepts with introduction of some advanced concepts in the area of chemical sciences relevant to engineering.
- This part of chemistry explains various aspects with regard to petroleum, coal and fuel, catalyst, metals and alloys, water quality, polymers.

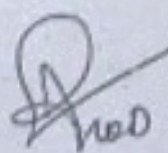
Course Outcomes (COs)

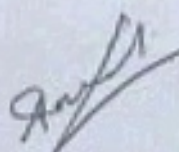
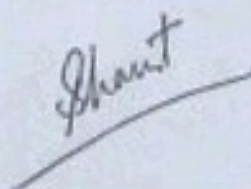
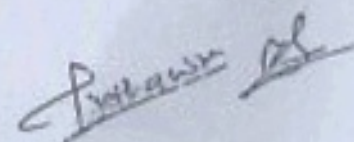
On completion of course the students are able:		
COs	COs statements	Bloom's Level
CO1	Understanding the characteristics of petroleum, coal & fuels and apply their knowledge of petroleum refining and their products.	Understand
CO2	Understand the concept of catalyst and surface chemistry for industrial purpose	Understand
CO3	Apply the concepts of metallurgy then analyze various types of metals and alloys	Apply
CO4	Apply the concept of basic sciences to understand characteristic of water.	Apply
CO5	Analyze the polymer and lubricants based on their properties and their suitability for industrial uses.	Analyze

Articulation Matrix

CO\PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	1	-	1	2	-	-	1	-	-	1
CO2	2	-	-	-	-	1	1	-	-	1	-	-	1
CO3	2	1	1	-	-	1	1	-	-	1	1	-	1
CO4	2	2	1	1	-	3	2	-	-	-	-	-	2
CO5	3	2	1	1	-	2	2	-	1	1	1	-	2

High-3 Medium-2 Low-1


 Head of Acad. Sciences

Unit: - I Petroleum

12 Hours

Introduction, Occurrence, Composition of petroleum, Origin, Classification of petroleum, refining of petroleum, purification of petroleum, Flash point, Knocking, Octane number.

Coal and Fuel : Types, composition, Structure, classification and properties of coal, calorific value of coal, analysis of coal. Types of fuel, advantages and disadvantages, combustion of fuels, calorific value.

Unit: - II Catalyst

12 Hours

Introduction, types, Homogeneous and Heterogeneous catalysis, Basic Principles of catalysis, Mechanism of catalysis, Factor affecting the catalysis reaction, Industrial uses of catalysis reaction.

Surface chemistry: Sols, Gels, Emulsion.

Unit: - III Metals and Alloys

12 Hours

Physical and chemical properties of metals, copper, iron, aluminium, tin, nickel. General principles of metallurgy, minerals/ ores, ore dressing, roasting, smelting, Explanation of alloying purposes, methods of alloying, composition and uses of alloy like brass, bronze, duralium, German silver, gun metal, solder, stainless steel, casting and bearing alloy.

Unit: - IV Water Treatment:

12 Hours


Introduction, Physical and chemical property of water, Hardness of water and their types, disadvantages of hard water, Different methods used for removing hardness of water, Scale and sludge, Specification for Industrial use, various water treatments.

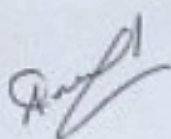
Unit: - V High Polymers and Rubber

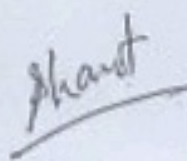
12 Hours

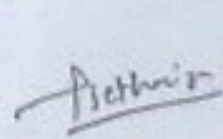

Introduction, polymerization, condensation and addition polymerization, classification of plastics. Preparation properties and uses of PVC, polythene, polystyrene, poly-amides, polyesters, Bakelite. Synthetic fibers, nylon, rayon, Dacron, and polyesters. Idea about rubber and vulcanization.

Lubricants: Meaning, types and theory of lubricants, properties of a good lubricants, Flash and fire point, cloud point, viscosity.


Prof. Atul Singh





List of Experiments:**30 Hours**

1. Determination of hardness of water by EDTA Method.
2. Determination of solid content in the given sample of water.
3. Determination of percentage of moisture in the given sample of coal by proximate analysis.
4. To determine the percentage of iron in a given sample of alloy by Redoximetry titration.
5. Determination of flash point and fire point of a given sample of oil by Abel's apparatus.
6. Determination of viscosity by Red Wood Viscometer no. 1 and no.2.
7. To determine strength of ferrous ammonium sulphate by redoximetry titration.
8. To identify cation and anion in a given sample.

Total hours: 90**References:**

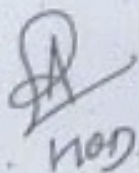
1. Engineering Chemistry, Jain & Jain.
2. Physical Chemistry, Bahl And Tuli.
3. Inorganic Chemistry, Satyaprakash.
4. Applied Chemistry, Dr. G. C. Saxena, Deepak Prakashan, Gwalior.
5. Polymer Chemistry, O.P. Mishra.
6. Applied Chemistry, H.N. Sahni, Deepak Prakash.
7. Industrial chemistry, B.K. Sharma
8. Environmental Chemistry, B.K.Sharma & A.K.Day

List of e-Learning Resources:

<https://nptel.ac.in/courses/103107082/>

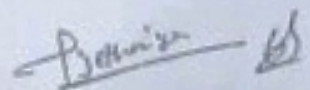
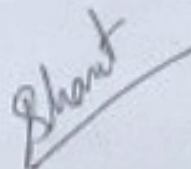
<https://nptel.ac.in/courses/122106030/>

<https://nptel.ac.in/courses/103/103/103103026/>



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Department of Mathematics
University, Mandsaur (M.P.)





**Diploma (EEE)
Semester-1**

L-3 T-1 P-2C-5

PHY010: Engineering Physics-I

Course Objectives

The main focus of the subject is to impart basic knowledge of principles of Physics such as

- Fundamentals of units and measurement which is need of modern industry.
- Properties of matter, Heat energy and its propagation are the part of the subject to make a technical student versatile and competent.

Course Outcomes (COs)

On completion of course the students are able to:		Bloom's Level
CO1	Understand the units and measurements.	Understand
CO2	Understand the velocity and acceleration parameters and how the vehicles move, and understand the laws and applications of gravitation.	Understand, Apply
CO3	Analyzing and applying the molecular theories of solids, liquids and gases.	Apply, Analyze
CO4	Understanding and analyzing the various properties of matter like elasticity, surface tension, viscosity and their important terms.	Understand, Analyze
CO5	Evaluate the applications of thermodynamics.	Apply, Evaluate

Articulation Matrix

(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

CO/PO/PS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PSO 1	PSO 2	PSO 3	PSO 4
O	1	2	3	4	5	6	7	8	9	1	2	3	4
CO1	1	2	3	2	-	1	2	1	2	1	2	1	1
CO2	2	3	2	3	-	2	2	3	2	3	3	3	2
CO3	-	1	2	3	1	-	-	1	1	2	2	2	1
CO4	-	1	1	1	-	-	1	1	2	1	1	2	1
CO5	2	3	3	2	-	1	2	1	2	3	3	2	2

High-3 Medium-2 Low-1

UNIT I: Units & Measurement

09 Hours

Fundamental and derived units, Scalar and vector, basic requirements to represent vector Symbols, abbreviation, and percolation, linear measurement by vernier callipers, screw gauge and spherometer, angular measurement by angular vernier.

UNIT II: Motion

09 Hours

Motion and its type, Linear motion (laws and equation), Circular motion, Angular velocity and relation with linear velocity, Centripetal acceleration, Centripetal and Centrifugal forces, Rotatory motion, Axis of rotation Moment of Inertia, Radius of gyration, the Kinetic energy of rotation.

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UNIT III: Molecular Phenomenon of Solids, Liquids and Gases

09 Hours

Postulates of Molecular Kinetic Theory of Structure of matter, Brownian motion, Kinetic and Potential energy of molecules, Kinetic theory of gases, calculation of pressure by Kinetic theory. prove of different gases law by Kinetic theory.

UNIT IV: Properties of Matter

05 Hours

Elasticity: Meaning & definition, Stress, strain, Hook's law and elastic limit, Surface Tension, molecular forces cohesive and adhesive forces, surface energy, capillary rise, capillary rise method, Viscosity : meaning & definition, stream line and turbulent flow critical velocity, Stock's law.

UNIT V: Heat

09 Hours

Heat and temperature, concept of heat as molecular motion, transmission of heat, study state and variable state, concept of heat capacity, specific heat and latent heat, Calorimeter and its uses, Thermodynamics relation between heat and work and mechanical equivalent of heat, first law of thermo dynamics and its application, second law of thermodynamics and its application, Carnot cycle.

(Competition exam related topics)

PRACTICAL

1. Verification of Ohm's law.
2. Study of series circuit.
3. Study of parallel circuit.
4. To find out internal radius of hollow tube by vernier calipers.
5. To find out volume of given cylinder by screw gauge.
6. To find out radius of curvature of a curved surface by Spherometer.
7. Focal length of a convex lens by displacement method.

Reference(s)

1. Applied Physics Vol. 1 & 2 - Saxena and Prabhakar.
2. Physics - Titi Publication.
3. Physics Vol. 1 & 2 - Halliday and Resnic R.
4. Engineering Physics- Gaur and Gupta.
5. Principle of Physics- Brij Lal & Subramanyan.
6. Physics for Technical Education- Ls Zednov.
7. Bhautiki- Deepshri Gupta.
8. Physics- Deepshri Gupta.

List of e-Learning Resources:

1. https://en.wikipedia.org/wiki/Molecular_physics
2. <https://www.britannica.com/science/thermodynamics#:~:text=Thermodynamics%20is%20%h%20study%20of,useful%20work%20on%20its%20surroundings.>
3. <https://byjus.com/chemistry/properties-of-matter/#:~:text=Any%20characteristic%20that%20can%20be,are%20considered%20propert%20of%20matter.>

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Mandsaur University, Mandsaur (458001)

CSE080: Fundamentals of Computer Science**Course Objectives**

- To familiarize students with the foundations of computers, its working and major components.
- To provide students with the core concepts of computer science.
- To provide an introduction to emerging trends in the domain of computer science.

Course Outcomes (COs)

- Understand core computer components and their interconnection.
- Apply computer networking fundamentals in developing a small network of computers and design a comparison matrix for emerging technologies' use cases.
- Understand various types of operating system for various environments.
- Understand various categories of software.
- Create the basic programs related to control structures and array using C programming language.

Articulation Matrix

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-	3	-	1	1	1	-	3	3	2	-
CO2	-	2	-	3	-	-	1	1	-	-	3	2	-
CO3	3	-	-	3	-	-	1	1	-	3	3	1	-
CO4	-	-	-	3	-	-	1	1	-	3	2	2	-
CO5	-	-	-	3	1	-	1	-	-	-	3	2	1

UNIT I: Introduction to Computers**9 Hours**

History of development of computers, Computer system concepts, characteristics, capabilities and limitations, Generations of computers, Basic components of a computer system – Control Unit, ALU, I/O Devices, memory – RAM, ROM, EPROM, PROM, Flash Memory and other types of memory. Information concepts & processing: definition of information, data V/S information, introduction to information system, information representation, digital media, images, graphics, animation, audio, video etc.

UNIT II: Data communication & networks**9 Hours**

Computer networks, networking of computers, introduction to LAN, WAN, MAN, network topologies, basic concepts in computer networks, ISO/OSI Model Introduction to internet technologies: HTML, DHTML, WWW, FTP, TELENET, web browser, Internet browsing, search engines, email.

UNIT III: Concepts in operating System**9 Hours**

Elementary concepts in operating system, GUI, introduction to DOS, MS windows, Unix/Linux. Storage devices: storage fundamentals – primary V/S secondary, data storage and retrieval methods – sequential, direct and index sequential. Various storage devices – magnetic tape, magnetic disks, cartridge tape, data drives, hard disk drives, floppy (Winchester disk), disks, optical disks, CD, VCD, CD-R, CD-RW, zip drive, DVD, SVCD.

UNIT IV: Types of Software**9 Hours**

System software, Application software, Utility Software, Demo ware, Shareware, Freeware, Firmware and Free Software. Microsoft office/Excel: MS word, MS excel, MS Office standard tool bars.

UNIT V: Programming languages**9 Hours**

Machine, assembly, high Level, 4 GL languages. Introduction to C: C Character Set, constants, variables and key words, decision and control Structure: if, if-else, forms of if-else statement, operators, types of Loops, case and switch Arrays, C functions – Call by values and Call by reference.

PRACTICAL**30 Hours**

- Study and to understand the operating system overview.
- Practice creating opening editing and saving the document using notepad.
- Practice browsing of different websites using search engines.
- Create a Resume or CV using Microsoft Word/Open Office.

5. Create a simple presentation using Power Point Tool.
6. Create a worksheet with four columns. Enter ten records and use the basic formula in sheet.
7. Introduction to C /C++. Print a hello word in C.
8. Write a program in C for addition of two values
9. Write a program in C/C++ to implement If- Else decision statement.
10. Write a program to print a pyramid using for loop.

Total: 75 Hours

Reference(s)

1. Balagurusamy E. (2009). Fundamentals of Computers. McGraw-Hill Technology Education, Boston.
2. Norton P. (2017). Introduction to Computers. 7th edition. McGraw-Hill Technology Education, Boston.
3. Silberschatz A., Galvin P.B. and Gagne G. (2018). Operating System Concepts. 10th edition. Wiley Publishing.

List of e-Learning Resources:

1. <https://nptel.ac.in/>
2. <https://learn.microsoft.com/>

Engineering Diploma - EEE

Semester I

L-2 T-0 P-0 C-2

Communication Skills- CS5090

Course Objectives:

- Communication skills are important for many professions but are crucial for students to develop their personality.
- They must be able to adapt their methods of communication to all regardless of ability or learning style.
- To equip the students to adapt methods of effective communication.

Course Outcomes:

- 1) Understand basic language skills and to be enriched with good vocabulary and diction.
- 2) Apply the process of communication and its importance.
- 3) Apply the language skills such as Listening, Speaking, Reading and Writing and Interpreting skills.
- 4) Apply comprehension skills.
- 5) Apply employability skills.

Articulation Matrix

(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

CO\PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	2	2	2	1	-	-	-	-	1	-	-	-	1
CO2	2	2	1	2	-	-	-	-	-	-	-	-	-
CO3	1	1	1	1	-	-	-	-	-	-	-	-	-
CO4	1	1	1	1	-	-	-	-	-	-	-	-	-
CO5	1	1	2	1	-	-	-	-	-	-	-	1	-

High-3 Medium-2 Low-1

Unit: I – Basic Language Skills:

12 Hours

- 1) Vocabulary building, Punctuations, Subject-Verb Agreement, suffix and Prefix, Antonyms, Synonyms, one-word substitute, Parts of Speech, Tenses, Articles, Homophones, Homonyms.

Unit: II - Communication Process and its Need:

12 Hours

- 1) Meaning of communication, Process of communication, Importance of communication, Types of communication, Barriers in communication.

Unit: III – Reading, Writing and Interpreting Skills:

12 Hours

- 1) Where the mind is without fear - Rabindranath Tagore (Key Word: Patriotism).
- 2) National Education - M. K. Gandhi (Key Word: Education).
- 3) The Axe – R.K. Narayan (Key Word: Environment).
- 4) The Wonder that was India – A.L. Basham (an Excerpt) (Key Word: Indianness).
- 5) Preface to the Mahabharata – C. Rajagopalachari (Key Word: Indian Mythology).

Unit: IV – Comprehension Skills

12 Hours

- 1) Unseen Passage followed by multiple choice questions.

Unit: V - Employability Skills:

12 Hours

- 1) Resume Writing, Interview skills, Group Discussion, Team-work, Role Plays, Mock Sessions, (Submission of CV), Presentation skills.

References:

1. Living English structure – By W.S. Allen; Longmans
2. English Grammar- Ehrlich, Schaum's Series, TMH
3. Spoken English for India – By R.K. Bansal and IB Harrison orient Longman
4. New International Business English – John and Alexander
5. Effective Technical Communication – Rizvi , TMH.
6. Essential English grammar- Raymond Murphy, Cambridge University Press.
7. Practical English Grammar Exercises- A.J. Thomson & A.V Martinet, Oxford India.
8. Practical English Usage- Michael Swan, Oxford
9. English Grammar in Use- Raymond Murphy, Cambridge University Press

5hrs per week

Total hours: 60 hours