





UPL University of Sustainable Technology

(Established Under State Private University Act, 2009)

Shroff S.R. Rotary Institute of Chemical Technology

First Year Curriculum for Diploma Courses in Engineering & Technology

A. Programs offered at Diploma Levels -

- 1. Chemical Engineering 2. Computer Engineering 3. Mechanical Engineering
- 4. Electrical Engineering 5. Environment Engineering 6. Information Technology

B. Structure of curriculum

Mandatory Induction Program

Induction program (mandatory)	Two-week duration
Induction program for students to be offered right at the start of the first Year.	 Physical activity Creative Arts Universal Human Values Literary Lectures by Eminent People Visits to local Areas Familiarization to Dept./Branch & Innovations

Semester-I/II (Computer Engg., Mechanical Engg., Electrical Engg.)

Sr. No.	Category of Course	Code No.	Course Title	Hours per week		Total contact hrs/	Total Credits	E	М	Ι	v	Total Marks	
110.	Course	110.		L	Т	Р	week	Creuits					1 v1a1 K5
1	Basic Science	MH1101	Mathematics-I	3	2	0	5	5	70	30	50	0	150
2	Basic Science	MH1104	Basic Physics	3	0	2	5	4	70	30	20	30	150
3	Engineering Science	MH1107	Basics of Electrical Engineering	2	0	2	4	3	70	30	20	30	150
4	Humanities & Social Science	MH1110	English	2	0	2	4	3	70	30	20	30	150
5	Engineering Science	MH1109	Engineering Graphics	1	0	6	7	4	70	30	20	30	150
6	Audit Course	1MH1111	Environmental Studies & Sustainability	1	0	0	1	0	50	0	0	0	50
		Total		12	2	12	26	19	400	150	130	120	800







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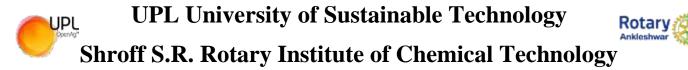
Semester-II/I (Chemical Engg., Environment Engg., Information Technology)

Sr.	Category of	Code	Course Title	Hours per week		Total contact	Total	Е	М	I	v	Total	
No.	Course	No.	000000 11000	L	Т	Р	hrs/ week	Credits			•	·	2000
1	Basic Science	MH1103	Mathematics-II	3	2	0	5	5	70	30	50	0	150
2	Basic Science	MH1102/ CO1101	Basic Chemistry / Programming in C [#]	3	0	2	5	4	70	30	20	30	150
3	Engineering Science	MH1108	Basics of Mechanical Engineering	2	0	2	4	3	70	30	20	30	150
4	Engineering Science	MH1105	Basics of Civil Engineering	2	0	2	4	3	70	30	20	30	150
5	Engineering Science	MH1106	Basics of Computer Engineering	2	0	2	4	3	70	30	20	30	150
6	Engineering Science	MH1112	Engineering Workshop Practice	0	0	6	6	3	0	0	60	40	100
		Total		12	2	14	28	21	350	150	190	160	850

Programming in C (CO1101) will be included in 2nd semester Computer Engineering & Information Technology instead of Basic Chemistry, w.e.f. A.Y. 2023-24.

C. Course code and definition:

Course code	Definitions
L	Lecture
Т	Tutorial
Р	Practical
Е	Theory External Examination Marks
М	Theory Internal Examination Marks
Ι	Practical Internal Examination Marks
V	Practical External Examination Marks



Diploma of Engineering Subject Code: MH1101 Subject Name: Mathematics-I

Semester: - I

Type of course: Engineering Science

Prerequisite: Knowledge of Basic Mathematics

Rationale: The subject is classified under Basic Sciences and students are intended to know about the basic concepts and principles of Mathematics as a tool to analyze the Engineering problems. Mathematics has the potential to understand the Core Technological studies

Teaching and Examination Scheme:

Teac	hing S	cheme	Credits		Examination Marks					Examination Marks				
L	Т	Р	С	Theory Marks		Practical N	Aarks	Marks						
				ESE (E)	PA (M)	ESE (V)	PA (I)							
3	2	0	5	70	30	0	50	150						

Sr.	Content	Total
No.		Hrs.
	SECTION-A	
1	Logarithm: Concept, Rules and related Examples.	3
2	Determinants and Matrices: Idea of Determinant and Matrix, Types of	8
	matrices, Addition and Subtraction, Product, Inverse up to 3X3 matrix,	
	Solution of Simultaneous Equations (up to three variables).	
3	Mensuration: Area of Triangle, Square, Rectangle, Trapezium,	7
	Parallelogram, Rhombus, Circle, Surface & Volume of Cuboids, Cone,	
	Cylinder and Sphere.	
	SECTION-B	1
4	Vectors: Basic concept of Vector and Scalar, Addition & subtraction,	8
	Product of Vectors, Geometric meaning of Scalar and Vector Product,	
	Angle between two vectors, Applications of Dot (scalar) and Cross-	
	(vector) Product, Work Done and Moment of Force.	
5	Trigonometry: Units of Angles (degree and radian), Allied &	6
	Compound Angles, Multiple –Submultiples angles, Graph of Sine and	



Diploma of Engineering Subject Code: MH1101 Subject Name: Mathematics-I

	Cosine, Periodic function, Sum and factor formulae				
6	Inverse Trigonometry: Introduction, Range and domain, Relation	4			
	between inverse Trigonometry, Basic formulae				

Text Books:

1. G C Patel, Basic Mathematics, Atul Prakashan

Reference Books:

- 1. Anthony croft and others, Engineering Mathematics (third edition), Pearson Education
- 2. W R Neelkanth, Applied Mathematics-I, Sapna Publication
- 3. S P Deshpande, Polytechnic Mathematics, Pune Vidyarthi Gruh Prakashan

List of Tutorial's:

- **1.** Tutorial-1 (Logarithm)
- **2.** Tutorial-2 (Determinants and Matrices)
- 3. Tutorial-3 (Determinants and Matrices)
- 4. Tutorial-4 (Determinants and Matrices)
- **5.** Tutorial-5 (Mensuration)
- **6.** Tutorial-6 (Mensuration)
- 7. Tutorial-7 (Vectors)
- 8. Tutorial-8 (Vectors)
- **9.** Tutorial-9 (Trigonometry)
- **10.** Tutorial-10 (Inverse Trigonometry)

Course Outcomes:

Students will be able to:

Sr. No.

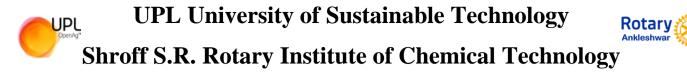
CO statement



Diploma of Engineering Subject Code: MH1101 Subject Name: Mathematics-I

CO-1	Define logarithmic function, Matrix, Determinant, vector and trigonometry
	function.
CO-2	Solve simple problems using concepts of Logarithms
CO-3	Calculate simultaneous equations using concepts of Determinants and
	Matrices
CO-4	Determine simple problems using concepts of Trigonometry
CO-5	Formulate simple problems using concepts of Vectors
CO-6	Measure the surface area and volume of different shapes and bodies.

- https://nptel.ac.in
- www.sosmath.com



Diploma Engineering Subject Code: MH1104 Subject Name: Basic Physics

Semester: - I/II

Type of course: Basic Science

Prerequisite: 10th Standard Science & Mathematics

Rationale: As Physics is considered as basic science, its principles, laws, hypothesis, concepts, ideas are playing important role in reinforcing the knowledge of technology. Deep thought is given while selecting topics in physics. They are different for various branches of engineering. This will provide sound background for self-development in future to cope up with new innovations. Topics are relevant to particular program and students will be motivated to learn and can enjoy the course of Physics as if it is one of the subjects of their own stream.

Teaching and Examination Scheme:

Teac	hing S	ing Scheme Credits Examination Marks						Total
т	т	р	C	Theory Marks		Practical N	Aarks	Marks
L		r	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Course Content:

Sr. No.	Content	Total Hrs.			
SECTION-A					
1	Unit – I SI Units & Measurements: Need of measurement and unit in engineering and science, definition of unit, requirements of standard unit, systems of units-CGS, MKS and SI, fundamental and derived quantities and their units, Least count and range of instrument, least count of vernier caliper, micrometer screw gauge, Definition of accuracy, precision and error, estimation of errors - absolute error, relative error and percentage error, rules and identification of Significant figures.	6			
2	Unit-2 Electrostatics:- Concept of charge, Coulomb's inverse square law, Electric field, potential and potential difference, Electric current, Ohm's law,	12			





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Diploma Engineering Subject Code: MH1104 Subject Name: Basic Physics

		1
	laws of series and parallel combination of resistance, D.C. circuits(Network, Branch, Active and Passive Electronic components, Loop and Junction, Symbols of Electronics components), Kirchhoff's law(KVL & KCL).	
3	Unit-3 Basic Laws of magnetic materials: Magnetic field and its units, magnetic intensity, magnetic lines of force, magnetic flux and their units, Dia, Para, Ferro magnetic materials, Electromagnetic Induction, Lenz's law and its Applications, Alternating current and its waveform.	6
	SECTION-B	
4	Unit-4 Heat and Temperature: Heat and temperature, Modes of Heat transfer (Conduction, Convection and Radiation), Temperature measurement scales (Kelvin, Celsius and Fahrenheit and inter conversion between them), Types of thermometers (Mercury thermometer, Bimetallic thermometer, Platinum resistance thermometer), Thermal conductivity, Applications of Thermal Conductivity.	6
5	Unit-5 Force and Motion: Recapitulation of equations of motion, Newton's 1st law of motion, Force, basic forces in motion, gravitational force, electrostatic force, electromagnetic force, nuclear force, Inertia, types of inertia (inertia of rest, inertia of motion, inertia of direction), Momentum, Newton's 2nd law of motion, measurement of force using second law, simple problems on $F =$ ma and equations of motion, Impulse of force, Impulse as the product of force and time, impulse as the difference of momentum, examples of impulse, simple problems on impulse, Newtons III rd law of motion and its examples. Law of conservation of momentum, Statement, simple problems.	8
6	Unit-6 Properties of Waves and Light: Definition of wave, amplitude, Time period, frequency, and wavelength, relation between velocity, frequency and wavelength, longitudinal and transverse wave, principle of superposition of waves, definition of stationary wave , node and antinode, definition of resonance with examples, Properties of Light, Electromagnetic spectrum, Reflection, refraction, Snell's law, diffraction, polarization, dispersion of light, interference of light, constructive and destructive interference (Only definitions),Refractive index, LASER, Properties of LASER, Application of LASER.	6

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Diploma Engineering Subject Code: MH1104 Subject Name: Basic Physics

Text Books:

- 1. A Textbook of Engineering Physics-I by Dr. Pankaj kumar, Khanna Publications.
- 2. Applied Physics, S S Patel, Atul Publication.

Reference Books:

- Concepts in Physics Vol. I and Vol. II, H C Verma, Bharti Bhawan Ltd. New Delhi, 2019
- Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi, 2019
- 3. Engineering Physics For Diploma, Bhuyan, Ranjan Kumar, PHI Learning pvt. ltd 2020
- 4. Text Book of Physics for Class XI (Part-I, Part-II), N.C.E.R.T., Delhi, 2019
- 5. Text Book of Physics for Class XII (Part-I, Part-II), N.C.E.R.T., Delhi, 2019
- 6. Dilip Gaikwad, Shailaja Padmakar, Swati Rane and Vaishali Morankar, Basic Physics, S. Chand.

List of Practical: (Min. 10 Practicals should be performed)

- 1. To Measure linear dimensions by vernier caliper and calculate volume.
- 2. To Measure linear dimensions by Micrometer screw.
- 3. To calculate resistance using Ohm's law.
- 4. To calculate resistance using Colour code method.
- 5. To verify law of Resistance in series and parallel.
- 6. To determine errors in electrical measurements.
- 7. To Measure A.C. Power using resistive load.
- 8. To study p-n junction in forward bias.
- 9. Determine acceleration due to gravity 'g' by using simple pendulum.
- 10. To determine Force constant with the help of periodic time of oscillations of spring.
- 11. Use different types of thermometers to measure temperature of a hot bath and convert it into different scales.
- 12. To measure and convert MKS physical quantity to CGS Physical Quantity and vice versa.



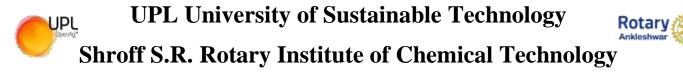
Diploma Engineering Subject Code: MH1104 Subject Name: Basic Physics

Course Outcomes:

Students will be able to:

Sr. No.	CO statement
CO-1	Select proper measuring instrument on the basis of range, least count &
	precision required for measurement.
CO-2	Analyze properties of material & their use for the selection of material mostly
0-2	applicable for engineering users.
CO-3	Identify good & bad conductors of heat and proper temperature scale for
0-5	temperature measurement.
CO-4	Identify, analyze, discriminate and interpret logical sequence of field problems
CO-4	with the study of physics.
CO-5	Analyze variation of sound intensity with respect to distance.
CO 6	Follow the principles used in the physical properties, its measurement and
CO-6	selections.

- www.physicsclassroom.com
- www.physics.org
- www.fearofphysics.com
- www.sciencejoywagon.com/physicszone
- www.science.howstuffworks.com



Diploma Engineering Subject Code: MH1107 Subject Name: Basics of Electrical Engineering

Semester: - I/II

Type of course: Engineering Science

Prerequisite: 10th Standard Science & Mathematics

Rationale: A diploma holder may be involved in various jobs ranging from preventive maintenance of electrical installation to fault location. In addition, he/she may be working in testing laboratories where he/she uses measuring instruments. To carry out these and similar jobs effectively, knowledge of basic concepts, principles and their applications is very essential. This course will enable the students to understand the basic concepts and principles of DC and AC fundamental, ac circuits, batteries, electromagnetic induction, electrostatics, semiconductor devices etc.

Course Objectives: To introduce the concept of Electrical energy, with the knowledge of electrical Current, voltage, power, energy and electrical circuits, DC circuits, electrostatics, Faraday's laws and Basic Electronic Circuits.

Teaching and Examination Scheme:

Teac	hing S	cheme	Credits	Examination Marks				Total
т	т	D	C	Theor	y Marks	Practical N	Aarks	Marks
L	I	Г	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
2	0	2	3	70	30	30	20	150

Course Content:

Content:

Sr. No.	Content			
	SECTION-A			
1	Basic Terminology and their concepts : Current, EMF, potential difference (Voltage), resistance, resistivity their units, Relationship between electrical, mechanical and thermal SI units of work, power and energy, Electrical Safety and precautions, Electrical power, energy and their units (SI).	4		
2	Fundamental of D.C. Circuit : Ohm's Law and its limitations, Series connections, Parallel connections and Series-Parallel combinations of Resistors and problems, Start-Delta	6		

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Diploma Engineering

Subject Code: MH1107

Subject Name: Basics of Electrical Engineering

	connections of Resistors and simple problems, Kirchhoff's voltage law &	
	Kirchhoff's current law and simple problems. Electrostatics :	
3	Working principle of capacitor, types of capacitor, Series and parallel combination of capacitors and simple problems, Charging and discharging of capacitors.	4
	SECTION-B	
4	Electromagnetics : Concept of magnetic flux, flux density, magnetic field intensity ,permeability and their units, B-H curve and magnetic hysteresis , concept of reluctance and mmf and simple problems, Rise and decay of current in inductors, Analogy between electric and magnetic circuits.	4
5	Electromagnetic Induction : Faraday's laws of electromagnetic induction. Lenz's law, Self and Mutual induced E.M.F., Energy stored in magnetic circuit, Force on a current carrying conductor placed in a magnetic field.	4
6	Fundamentals of A.C. Circuits : Instantaneous value, maximum (peak) value, cycle, frequency, alternate current and voltage, Difference between AC and DC, Equation of an alternating voltage and current and wave shape varying sinusoidal, Average and RMS value of alternating voltage and current. Importance of RMS value and Simple problems, Concept of phase, phase difference and phasor representation of alternating voltage and current, Single phase A.C. through pure resistance, inductance, capacitance, R-L, R-C, R-L-C Series & Parallel circuit and simple problems, Resonance (Series and parallel) circuit Active -Reactive and Apparent power & Power Factor, Generation of 3-phase voltage, Phase Sequence , Interconnection of three phase Star – Delta Voltage ,Current & Power relationship in balanced 3-Phase Circuits, Measurement of power in 3-phase circuit and Effect of power factor on Wattmeter readings.	14



Diploma Engineering Subject Code: MH1107 Subject Name: Basics of Electrical Engineering

Text Books:

- 1. Basic Electrical and Electronics Engineering By B. L. Theraja Vol.-1 S. Chand Publications.
- 2. Fundamentals of Electronics by Anokh singh, Khanna Publications.

Reference Books:

- 1. Principles of Electronics by V K Mehta & Rohit Mehta S. Chand Publications
- 2. Basic Electrical Engineering by J B Gupta; SK Kataria and Sons, New Delhi.
- 3. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.

List of Practical: (Min. 10 Practicals should be performed)

- 1. Draw different types of Circuit symbols.
- 2. To Verify 4 & 5 Band Resistor using Color Code method with Multimeter.
- 3. To measure various AC signals in Digital storage Oscilloscope (DSO) using Function Generator.
- 4. Experimental verifications of the Kirchhoff's laws.
- 5. Experimental Verification of voltage and current relations in Star and delta connected Systems.
- 6. Experimental Verification of laws of capacitors in series and parallel.
- 7. Determine Frequency, Time Period, Peak value, RMS Value, Peak Factor & Form Factor of Sinusoidal AC waveform by using DSO.
- 8. To plot Volt-Ampere Characteristics of Silicon P-N Junction Diode.
- 9. To determine the electrical power of a single-phase AC series R-C circuit and compute The value of Capacitance by vector method.
- 10 To determine the electrical power of a single-phase R-L A.C. series circuit and Compute the value of Inductance by vector method.
- 11 Measurement of electrical power in a 3-phase A.C. circuit by two wattmeter method.

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Diploma Engineering

Subject Code: MH1107

Subject Name: Basics of Electrical Engineering

- 12 To measure three phase power by using two wattmeter method.
- 13. Determine the permeability of magnetic material by plotting its B-H curve.
- 14. To prepare a report on safety precautions while working on electric installations and necessity of Earthing.
- 15. Measurement of Earth resistance of electrical equipment.

Course Outcomes:

Students will be able to:

Sr. No.	CO statement				
CO-1	Describe the sources of energy, applications, different electrical parameters				
0-1	and symbols.				
CO-2	Determine Ohm's law, Resistance combinations, Start-Delta network and to				
0-2	Solve problems.				
CO-3	Generalized the Electrical Work, Power and Energy and understand Joule's				
0-5	law. Solve problems.				
CO-4	Earthing. Electrostatics and Electromagnetic laws and Solve related problems.				
CO-5	Explain Single phase and Three Phase AC circuits and Solve related problems.				
CO-6	Develop Basic Electronic circuits and their applications.				

- Vlabs.iitb.ac.in
- NPTEL tutorials
- www.coursera.org



UPL University of Sustainable Technology Rotar Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering

Subject Code: MH1110

Subject: English

Semester-I/II

Type of course: Language and Communication

Prerequisite: Zeal to learn the Language

Rationale: The rationale of the curriculum is to help students refresh their knowledge of English language. It also targets the understanding of grammar, focusing in comprehension, and reading, speaking and writing skills.

Teaching and Examination Scheme:

Teac	hing S	cheme	Credits		Examinati	on Marks	Total	
L	Т	Р	С	Theory Marks		Practical N	Marks	Marks
				ESE (E)	PA (M)	ESE (V)	PA (I)	
2	0	2	3	70	30	30	20	150

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	Parts of Speech: Recognition and review of Nouns, Pronouns, Verbs, Adverbs, Adjectives, Prepositions. Conjunctions & Interjections, Knowledge of Subject, Object and Compliment of the Verb, Verbals – Infinitive, Gerund and Preposition	5
2	Prepositions of time and place : Contextual teaching of prepositions of time - on, in , at, since, for, ago, before, to, past, to, from, till/until, by Prepositions of place: in, at, on, by, next to, beside, near, between, behind, in front of, under, below, over, above, across, though, to, into, towards, onto, from	4
3	Phrases and Clauses : Basic definitions of clauses and phrases Focus on Relative Pronouns Use in sentences as relative clauses	3
	SECTION-B	
4	Sentence types and Transformation of sentences :Assertive sentences, Exclamatory sentences, Interrogative sentences, Negative sentences, Compound sentences, Complex sentences, Simple sentences, Degrees of Comparison	4



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Subject Code: MH1110

Subject: English

5	Word formations Affixes: Prefixes and Suffixes, Change of one part of	4
	speech to the other: from Verbs to Nouns, Nouns to Verbs, Adjectives to	
	Nouns, Nouns to Adjectives, Verbs to adverbs, Adverbs to Verbs	
6	Paragraph Writing & Punctuation: Descriptive Paragraph on related	4
	topic, Use of the comma, full stop, Semi-colon, colon, apostrophe,	

Text Book:

1. Communication Skills by Pushplatha & Sanjay Kumar, OUP **Reference Books:**

1. Essential English Grammar with Answers by Raymond Murphy (Cambridge University Press)

2. English Grammar by Annie Brinda (Cambridge University Press)

List of Practical/ tutorials:

- **1.** Introducing oneself
- **2.** Introduction about family
- **3.** Discussion about the weather
- 4. Seeking Permission to do something
- **5.** Description about hobbies
- 6. Seeking Information at Railway Station/ Airport
- 7. Taking Appointments from superiors and industry personnel
- 8. Conversation with the Cashier- College/ bank
- 9. Discussing holiday plans
- 10. Asking about products in a shopping mall

Course Outcomes:

After completion of this course students will able to

Sr. No.	CO statement
CO-1	Present basic sentences in English.
CO-2	Construct grammatically correct sentences in English
CO-3	Use grammatically correct English sentences in everyday situations.
CO-4	Connect with varied English vocabulary in everyday situations confidently
CO-5	Relate themselves orally using simple English.
CO-6	Assess reading and validate lifelong learning in English

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Diploma of Engineering

Subject Code: MH1110

Subject: English

- http://www.free-english-study.com/
- http://www.english-online.org.uk/course.htm
- https://www.grammar-quizzes.com/noun-forms.html

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Diploma of Engineering Subject Code: MH1109 Subject Name: Engineering Graphics

Semester: - I/II

Type of course: Engineering Science course

Prerequisite: Zeal to learn the subject

Rationale: Engineering Drawing is an effective language of engineers. It is the foundation block which strengthens the engineering & technological structure. Moreover, it is the transmitting link between ideas and realization.

Teaching and Examination Scheme:

Teac	hing S	cheme	Credits	Examination Marks				Total
L	Т	Р	С	Theory Marks		Practical N	Aarks	Marks
				ESE (E)	PA (M)	ESE (V)	PA (I)	
1	0	6	4	70	30	30	20	150

Sr.	Content	Total			
No.		Hrs.			
	SECTION-A				
1	Introduction to Engineering Graphics: Drawing instruments and	6			
	accessories, BIS – SP 46. Use of plane scales, Diagonal Scales and				
	Representative Fraction				
2	Engineering Curves: Classification and application of Engineering	18			
	Curves, Construction of Conics, Cycloidal Curves, Involutes and Spirals				
	along with normal and tangent to each curve				
3	Projections of Points and Lines: Introduction to principal planes of	18			
	projections, True length and inclination with the reference planes.				
	Projections of Solids, Section of Solids and Development of Surfaces:				
	Classification of solids. Projections of solids (Cylinder, Cone, Pyramid				
	and Prism) Development of surfaces				
	SECTION-B				
4	Orthographic projections: Introduction to Orthographic projections,	18			
	Conversion of pictorial view into Orthographic Views (First Angle				





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Diploma of Engineering Subject Code: MH1109 Subject Name: Engineering Graphics

Susjeer tame	
Projection Method Only), Dimensioning technique as per SP-46	
Isometric Projections and Isometric View or Drawing : Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing of simple objects.	18
Computer Aided Drawing: Introduction to AutoCAD, Basic commands for 2D drawing like: Line, Circle, Polyline, Rectangle, Hatch, Fillet, Chamfer, Trim, Extend, Offset, Dim style, etc	6
	Isometric Projections and Isometric View or Drawing: IsometricScale, Conversion of orthographic views into isometric projection, isometric view or drawing of simple objects.Computer Aided Drawing: Introduction to AutoCAD, Basic commands for 2D drawing like: Line, Circle, Polyline, Rectangle, Hatch, Fillet, Chamfer, Trim, Extend, Offset,

Text Books:

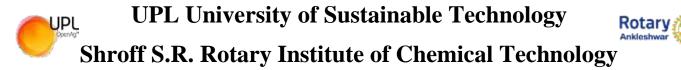
- 1. **A Text Book of Engineering Graphics** by P.J.Shah S.Chand & Company Ltd., New Delhi
- 2. **A Text book of Engineering Drawing** by R.K.Dhawan, S.Chand & Company Ltd., New Delhi

Reference Books:

- 1. Elementary Engineering Drawing by N.D.Bhatt Charotar Publishing House, Anand
- 2. Engineering Drawing by Jolhe D A, Tata McGraw Hill Edu. New Delhi,
- 3. Engineering Graphics by Arunodayaya Kumar, Tech-Max Publication, Mumbai
- 4. Mechanical Engineering Drawing by N S Salunke, Tech-Max Publication, Mumbai

List of Practical/ tutorials:

- 1. Practice sheet (which includes dimensioning methods, different types of line, construction of different polygon, divide the line and angle in parts, use of stencil)
- 2. Plain scale and diagonal scale
- 3. Loci of Points
- 4. Engineering curve
- 5. Projection of Line
- 6. Projection of Plane
- 7. Orthographic Projection
- 8. Isometric Projection



Diploma of Engineering Subject Code: MH1109

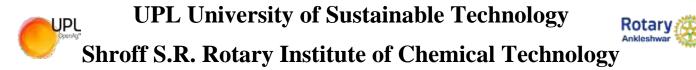
Subject Name: Engineering Graphics

- 9. Draw basic 2D entities like: Circles, Arcs, circular using AutoCAD (Printout should be a part of progressive assessment).
- 10. Draw basic 2D entities like: Rectangle, Rhombus, Polygon using AutoCAD (Print out should be a part of progressive assessment).

Course Outcomes:

Sr. No.	CO statement						
CO-1	Know and understand the conventions and the methods of engineering						
	drawing.						
CO-2	Interpret engineering drawings using fundamental technical mathematics.						
CO-3	Construct basic and intermediate geometry and comprehend the theory of						
	projection						
CO-4	Improve their visualization skills so that they can apply these skills in						
	developing new products.						
CO-5	Develop their technical communication skill in the form of communicative						
	drawings.						
CO-6	Visualization and use of basic commands of 2D designing software.						

- 1. NPTEL tutorials
- 2. https://www.youtube.com/watch?v=TJ4jGyD-WCw
- 3. https://www.youtube.com/watch?v=dmt6_n7Sgcg



Diploma of Engineering Subject Code: 1MH1111 Subject Name: Environmental Studies & Sustainability

Semester: - I/II

Type of course: Audit Course

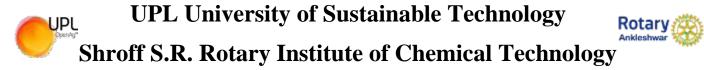
Prerequisite: Enthusiasm about conservation of natural resources and sustainable development for sustaining the life on the mother earth.

Rationale: The principal motive of this subject is to make students aware about environment and related aspects.

Teaching and Examination Scheme:

Teac	hing S	cheme	Credits		Examinati	on Marks		Total
L	Т	Р	С	Theor	y Marks	Practical N	Aarks	Marks
				ESE (E)	PA (M)	ESE (V)	PA (I)	
1	0	0	0	50	0	0	0	50

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	Definition, Scope and Importance, Need of public awareness- Environment, Effect of human activities on Environment-Agriculture, Housing & Industries, Ecosystem, Food chain, Biodiversity	2
2	Natural Resources, Water borne diseases, Minerals related problems in water.	2
3	Energy: Conventional and non-conventional sources, Biomass and Biogas, Alternative source of Energy- Hydrogen	2
	SECTION-B	
4	Environmental pollution, effects and Control: Water, Air, Noise, Land & Thermal, Environmental Management: Solid Waste, Plastic Waste & e-waste.	2
5	Current Environmental Issues and Importance: Public Growth, Climate change and Global warming, Acid Rain, Ozone layer depletion,	2
6	Environmental treaties, Agreements & Protocols-National & International Basics of Environmental Audit, Sustainable Development, Environment Protection: Role of Government, Legal Aspects, Initiatives by NGOs,	2



Diploma of Engineering

Subject Code: 1MH1111

Subject Name: Environmental Studies & Sustainability

National organization.

Suggested Specification table with Marks (Theory):

	Distribu	ition of Theory	Marks		
R Level	U Level	A Level	N Level	E Level	C Level
30	30	20	20	0	0

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Text Books:

- 1. Text book of Environmental Science & Technology- m. Anji Reddy- BS Publication
- **2.** Basics of Environmental Studies by U K Khare, 2011 Published by Tata McGraw Hill

Reference Books:

- 1. Environmental Studies by Benny Joseph, TMH publishers
- 2. Environmental Studies by R. Rajagopalan, Oxford University Press
- 3. Environmental Studies- R. Rajagopalan-Oxford Publication

Course Outcomes:

Students will be able to:

Sr. No.	CO statement
CO-1	Define the principles and scope of Environmental Science
CO-2	Identify the types of pollution in society along with their sources and effects
CO-3	Demonstrate the generation and management of various wastes
CO-4	Relate the national & international environmental issues and treaties.

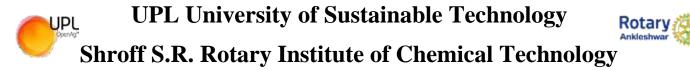


Diploma of Engineering Subject Code: 1MH1111

Subject Name: Environmental Studies & Sustainability

CO-5	Explain	the	concept	Sustainable	development	and	Environment
	managem	ent					
CO-6	Annraiga	than	ale of gove	mmont and no	on-government of	raani	zation
0-0	Appraise	the ro	She of gove	minent and no	on-government (organi	zation

- NPTEL tutorials
- www.coursera.org



Diploma of Engineering Subject Code: MH1103 Subject Name: Mathematics-II

Semester: - II

Type of course: Engineering Science

Prerequisite: Knowledge of Basic Mathematics

Rationale: The course is classified under Advance Mathematics and students are intended to understand the advance concepts and principles of Mathematics such as calculus, complex numbers, and differential equations. This knowledge is required to understand and solve engineering problems.

Teaching and Examination Scheme:

Teac	hing S	cheme	Credits		Examinati	on Marks		Total
L	Т	Р	С	Theor	y Marks	Practical N	/larks	Marks
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	2	0	5	70	30	0	50	150

Sr.	Content	Total
No.		Hrs.
	SECTION-A	
1	Complex Number: Concept, Modules and Amplitude form, Root of	4
	Complex Number, De Moivre's Theorem and it's application in simple	
	engineering problems.	
2	Function & Limit: Concept and Examples of functions, Concept of	6
	Limit, Standard Formulae, Related Examples	
3	Differentiation & it's Applications: Definition, Rules of Sum, Product,	8
	Quotient of Functions, Chain Rule, Derivative of Implicit functions and	
	Parametric functions, Logarithmic Differentiation, Successive	
	Differentiation up to second order, Application: Velocity, Acceleration,	
	Maxima & Minima. (Simple problems)	
	SECTION-B	
4	Integration: Concept, Integral of Standard Functions, Working Rules of	7
	Integration, Integration by Parts, Integration by Substitution Method,	
	Definite Integral and its properties	





Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering Subject Code: MH1103 Subject Name: Mathematics-II

5	Application of Integration: Application: Area and Volume. (Simple	4
	problems)	
6	Differential Equations (First Order First Degree): Definition, Order	7
	and Degree of Differential Equation, Formation of Differential Equation,	
	Solution of Differential Equation of First Degree and First Order by	
	Variable Separable, Homogeneous and Integrating Factor methods.	

Text Books:

- 1. G C Patel, Advanced Mathematics, Atul Prakashan
- 2. Sachin Gajjar, Advanced Mathematics, Mahajan Publishing House

Reference Books:

- 1. Anthony croft and others, Engineering Mathematics (third edition), Pearson Education 2012
- **2.** Pandya N R, Pandya N R, Advanced Mathematics for Polytechnic, Macmillan Publishers India Ltd.,2012
- 3. S P Deshpande, Polytechnic Mathematics, Pune Vidyarthi Gruh Prakashan
- 4. Prakash D S, Polytechnic Mathematics, S Chand, 1985

List of Tutorials:

- **1.** Tutorial-1 (Complex Number)
- **2.** Tutorial-2 (Function & Limit)
- **3.** Tutorial-3 (Function & Limit)
- **4.** Tutorial-4 (Differentiation & it's Applications)
- 5. Tutorial-5 (Differentiation & it's Applications)
- 6. Tutorial-6 (Differentiation & it's Applications)
- 7. Tutorial-7 (Integration)
- **8.** Tutorial-8 (Application of Integration)
- **9.** Tutorial-9 (Differential Equations)



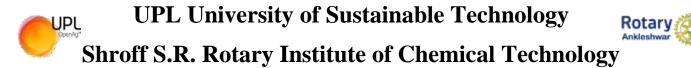
Diploma of Engineering Subject Code: MH1103 Subject Name: Mathematics-II 10. Tutorial-10 (Differential Equations)

Course Outcomes:

Students will be able to:

Sr. No.	CO statement
CO-1	Define Complex numbers and limit.
CO-2	Identify the roots of complex number using De Moivre's theorem.
CO-3	Solve the problem of function using the concept of Limit
CO-4	Calculate velocity, acceleration and maxima & minima
CO-5	Integrate to find Area and Volume
CO-6	Evaluate solution of differential equations using Variable Separable,
	Homogeneous and Integrating Factor methods.

- https://nptel.ac.in
- www.sosmath.com



Diploma of Engineering Subject Code: MH1102 Subject Name: Basic Chemistry

Semester: - I/II

Type of course: Basic Science

Prerequisite: Zeal to learn the subject

Rationale: Chemistry is considered as Basic Science subject

Teaching and Examination Scheme:

Teac	hing S	cheme	Credits		Examinati	on Marks		Total
L	Т	Р	С	Theor	y Marks	Practical N	Marks	Marks
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Sr.	Content	Total
No.		Hrs.
	SECTION-A	
1	Chemical Bandings and Solutions : Ionic bonds, co-valent bonds, co- ordinate co-valent bonds, H bonds, Types of solutions, different methods of expressing strength of solutions, viz. molarity. molality, normality, formality, preparation of standard solutions	4
2	Metal, Alloy & Corrosion of metals & its prevention: Physical Properties of Metal, Alloy & need of alloying of metal, Definition of corrosion, Types of corrosion, Dry corrosion: Oxidation corrosion mechanism corrosion-mechanism, Nature of oxide film, Wet corrosion- mechanism, Galvanic Corrosion, Concentration cell corrosion, Pitting corrosion, Waterline corrosion, Methods of prevention of corrosion- Cathodic protection method, Coating, Inhibitor	6
3	Water Technology: Hard water and soft water, Types of hardness of water Examples to calculate the hardness Effect of hard water in Boiler operation, Scale and sludge formation and it's Prevention, Caustic embrittlement and it's prevention, Softening of Water, Soda-Lime process, Permutit process, Ion Exchange process, Reverse Osmosis process, Break-point chlorination, Treatment of domestic and industrial	7





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Diploma of Engineering Subject Code: MH1102 Subject Name: Basic Chemistry

	waste water	
	SECTION-B	
4	Basic Concepts of Organic Chemistry : Introduction: Organic chemistry, Difference between organic and Inorganic compound, Types of Organic Compound, Saturated & Unsaturated hydrocarbon, IUPAC nomenclature of aliphatic compounds	6
5	Lubricants : Introduction and definition of lubricants and lubrication, function of lubricants, Types of lubrication: Fluid film lubrication, Boundary lubrication, Classification of lubricants: Solid lubricants, Semi- solid lubricants, Liquid lubricants, Viscosity & viscosity index, Flash point and fire point, Pour point and cloud point, Chemical Properties of lubricants: Saponification value, Neutralization number, Emulsification number	6
6	Polymer & Rubber : Introduction and Definition of Polymer and Monomer, Classification of Polymer, Types polymerization Reaction, Addition Polymerization, Condensation Polymerization, Synthesis, properties and application of Polyethylene, Polypropylene, Polyvinyl chloride, Polystyrene, Phenol formaldehyde, Acrylonitrile, Define the term:- Elastomers, Types of Rubber: Natural Rubber & Synthetic Rubber, Natural rubber and its properties, Vulcanization of rubber, Synthetic rubber, Synthesis, properties and uses of Buna-S Rubber, Buna- N Rubber, Neoprene Rubber	7

Text Books:

- 1. J. Rajaram, A Text Book of Applied Chemistry, Tata McGraw Hill Co. New Delhi
- 2. V. P Mehta, A Text Book of Polytechnic Chemistry, Jain Brothers

Reference Books:

- 3. Jain & Jain , Engineering Chemistry, Dhanpat Rai and Sons
- 4. S S Dara, Engineering Chemistry, S.Chand Publication

List of Practicals:

- 1. Basic terms used in Chemistry lab (Theoretical)
- 2. Determine the strength of given acidic solution using standard solution of base
- 3. Determine the percentage of Fe in given steel alloy sample
- 4. Study of corrosion of metals in medium of different pH





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Diploma of Engineering Subject Code: MH1102 Subject Name: Basic Chemistry

- 5. Determine pH-Values of given samples of Solution by using Litmus paper, pH Paper and pH-meter
- 6. Determine the hardness of given water sample by EDTA method
- 7. Determine the alkanity of given water sample
- 8. Assign IUPAC names to first five members of Alkane and Alkene series (Theoretical)
- 9. Determine the saponification value of a lubricating oil
- 10. Determine Flash & Fire point of given lubricating oil
- 11. To Determine molecular weight of a polymer using Ostwald viscometer
- 12. Preparation of (any one) polystyrene, urea formaldehyde, phenol formaldehyde
- 13. Vlab/Demo: Water analysis-Determination of Physical parameters
- 14. Vlab/Demo: Water analysis-Determination of Chemical parameters

Course Outcomes:

Students will be able to:

Sr. No.	CO statement
CO-1	Define the fundamentals of Chemical bonding & Preparation of solutions
CO-2	Explain types of corrosion & how to control corrosion of metal
CO-3	Apply knowledge of water technology to resolve the issues of drinking water
CO-4	Classify organic compounds and nomenclature of compounds
CO-5	Evaluate the properties of lubricating oils.
CO-6	Combine different monomers to get good quality of polymer & Rubber

- Vlabs.iitb.ac.in
- NPTEL Videos
- https://vlab.amrita.edu/

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> Diploma of Engineering Subject Code: MH1108 Subject Name: Basics of Mechanical Engineering

Semester: - I / II

Type of course: Engineering Science Course

Prerequisite: Zeal to learn the subject

Rationale: To provide a comprehensive knowledge of fundamental concept of mechanical engineering and to understanding working of simple mechanical devices for the students of Engineering.

Teaching and Examination Scheme:

Teac	hing S	cheme	Credits	Examination Marks				Total
L	Т	Р	С	Theory Marks		Practical N	Aarks	Marks
				ESE (E)	PA (M)	ESE (V)	PA (I)	
2	0	2	3	70	30	30	20	150

Content:

Sr. No.	Content	
	SECTION-A	
1	Introduction: Prime movers and its types, Concept of Force, Pressure, Energy, Work, Power, System, Heat, Temperature, Specific heat capacity, Change of state, Path, Process, Cycle, Internal energy, Enthalpy, Statements of Zeroth law, First Law of Thermodynamics and Second Law of Thermodynamics	02
2	Properties of Pure Substances: Boyle's law, Charles's law, Gay- Lussac's law, Avogadro's law, Combined gas law, Gas constant, Relation between Cp and Cv, Various non-flow processes like constant volume process, constant pressure process, Isothermal process, Adiabatic process, Polytropic process, Steam formation, Types of steam, Enthalpy, Specific volume, Internal energy and dryness fraction of steam, use of steam tables, steam calorimeters	06
3	Steam Boilers: Introduction, Classification, Cochran, Lancashire and Babcock and Wilcox boiler, Functioning of different mountings and accessories	04
	SECTION-B	

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Diploma of Engineering Subject Code: MH1108 Subject Name: Basics of Mechanical Engineering

4	 Heat Engines: Heat engine cycle and Heat engine, working substances, Classification of heat engines, Description and thermal efficiency of Carnot; Rankine; Otto cycle and Diesel cycles Internal Combustion Engines: Introduction, Classification, Engine details, four-stroke/ two-stroke cycle Petrol/Diesel engines, Indicated power, Brake Power, Efficiencies 	05	
5	 Pumps: Types and operation of Reciprocating, Rotary and Centrifugal pumps, Priming Air Compressors: Types and operation of Reciprocating and Rotary air compressors, significance of Multistage Refrigeration & Air Conditioning: Refrigerant, Vapor compression refrigeration system, Vapor absorption refrigeration system, Window and split air conditioners 	05	
6	Engineering Materials: Types, properties and applications of Ferrous & Nonferrous metals, Timber, Abrasive material, silica, ceramics, glass, graphite, diamond, plastic and polymer	02	

Textbooks:

1. A text book of Basics of Mechanical Engineering By R.B. Varia, Atul Prakashan.

Reference Books:

- 1. Elements of Mechanical Engineering by N M Bhatt and J R Mehta, Mahajan Publishing House
- 2. Basic Mechanical Engineering by Pravin Kumar, Pearson Education
- 3. Fundamental of Mechanical Engineering by G.S. Sawhney, PHI Publication New Delhi
- 4. Elements of Mechanical Engineering by Sadhu Singh, S. Chand Publication
- 5. Introduction to Engineering Materials by B.K. Agrawal, McGraw Hill Publication, New Delhi

List of Practical:

- 1. Study of working principles of Cochran boiler and Babcock & Wilcox boiler
- 2. To understand construction and working of different boiler mountings.
- 3. To understand construction and working of different boiler accessories.
- 4. To study working of different Calorimeter.
- 5. To understand construction features of two and four stroke Petrol engines.
- 6. To understand construction features of two and four stroke Diesel engines.
- 7. To determine brake thermal efficiency of an I. C. Engine.

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Diploma of Engineering Subject Code: MH1108 Subject Name: Basics of Mechanical Engineering

8. To understand construction and working of various Air Compressors.

9. To understand construction and working of Pumps.

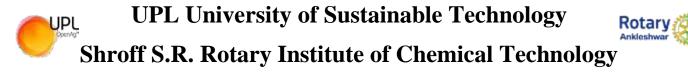
10. To demonstrate vapour compression refrigeration cycle of Window air conditioner and Split air conditioner.

Course Outcomes:

Students will be able to:

Sr. No.	CO statement
CO-1	Describe the basic terminology of Mechanical engineering.
CO-2	Make calculations for commonly used working fluids i.e. ideal gases and steam
CO-3	Analyze various heat engine cycles and understand construction and working of IC engines.
CO-4	Compile working and applications of steam boilers and various accessories and mountings of boilers.
CO-5	Discuss working and applications of pumps, compressors & refrigeration and air conditioning systems.
CO-6	Compare properties of various engineering materials with their applications.

- Vlabs.iitb.ac.in
- http://nptel.ac.in
- www.coursera.org



Diploma of Engineering Subject Code: MH1105 Subject Name: Basic of Civil Engineering

Semester: - I/II

Type of course: Engineering Science

Prerequisite: Basic Knowledge of Higher Secondary Mathematics and Science

Rationale: This subject envisages making the student know the fundamentals of Civil Engineering. This course mainly encompasses the major and general areas of civil engineering, knowledge of which may be required by mechanical and electrical engineers/technicians

Teaching and Examination Scheme:

Teac	hing S	cheme	Credits	Examination Marks				Total
L	Т	Р	С	Theory Marks		Practical N	Aarks	Marks
				ESE (E)	PA (M)	ESE (V)	PA (I)	
2	0	2	3	70	30	30	20	150

Sr.	Content	Total						
No.		Hrs.						
SECTION-A								
1	CIVIL ENGINEERING SURVEYING –I :Surveying & leveling (its importance and types), Necessity for leveling, Principals of surveying, Instrument/ tools used for survey and level, Various methods of finding the field survey measurements Chain Survey.	4						
2	CIVIL ENGINEERING SURVEYING –II: Compass Survey, Preparations of contour sheets/ plan using survey data, Procedure of leveling.	4						
3	CIVIL ENGINEERING DRAWING: Types of building drawings, Abbreviation, conventions & symbols in civil drawing, Building byelaws for planning of residential building and industrial building Planning of simple residential and industrial building. SECTION-B	4						
4	CONSTRUCTION MATERIALS: Common construction materials such as cement, Brick, Stone, Timber, Steel and Concrete, Properties of each materials & their acceptable standards, Quality parameters of	4						





Shroff S.R. Rotary Institute of Chemical Technology

Diploma of Engineering Subject Code: MH1105 Subject Name: Basic of Civil Engineering

	materials.					
5	Water Resources Engineering : Basic definition, Hydrological cycle,	4				
	water conservation and its use, rain water harvesting, Water shed					
	Management					
6	Transportation Engineering: Introduction, Role of transportation,					
	Mode of transportation, Types of pavement, Basic Knowledge of					
	Traffic engineering.					

Text Books:

- 1. R. P. Rethaliya, "Basic civil engineering"
- 2. R. P. Rethaliya, "Elements of Civil Engineering"

Reference Books:

- **1.** T.P.Kanitkar, "Text book on Surveying & leveling "
- 2. B.C.Punmia, "Text hook on Surveying & leveling "
- 3. Shah Kalel & Patkil, "Civil Engineering Drawing"
- 4. S.C. Rangwala, "Engineering Material", S. Chand Publishing
- 5. L.R Kadiyali, ""Traffic and highway engineering""

List of Practicals:

- 1. Practice for linear measurements through ranging, chaining, taping offsetting, recording field book etc.
- 2. Practice for working on prismatic compass for taking measurements and angles.
- 3. Practice for working dumpy Levels, for taking measurements and, recording length.
- 4. Prepare surveying drawings using surveyed data (Study Practical)
- 5. Prepare plan, elevation and section of residential building. (Study Practical)
- 6. Test construction material cement for field test.
- 7. Test construction material cement in laboratory.
- 8. Test construction material brick for field test
- 9. Test construction materials brick in laboratory



Diploma of Engineering Subject Code: MH1105 Subject Name: Basic of Civil Engineering

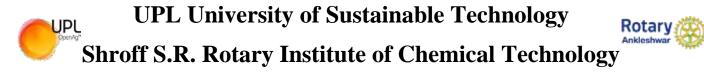
10. Market survey of construction materials

Course Outcomes:

Students will be able to:

Sr. No.	CO statement
CO-1	Describe fundamentals of surveying
CO-2	Understand various construction symbols and drawings
CO-3	Use various civil engineering materials for different purpose
CO-4	Illustrate drawing symbols in field data
CO-5	Evaluate different methods of water conservation
CO-6	Create and recognize different solution for problems related
	to pavement and traffic.

- Autocad for drawings
- https://npyel.ac.in



Diploma of Engineering Subject Code: MH1106 Subject Name: Basics of Computer Engineering

Semester: - I/II

Type of course: Engineering Science

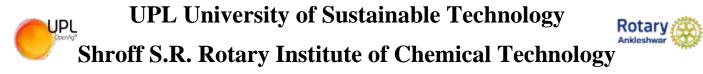
Prerequisite: Knowledge of Computer

Rationale: This subject is intended to make students comfortable with computing environment – Learning basic computer skills, software tools, Understanding of hardware, Cyber Security awareness.

Teaching and Examination Scheme:

Teac	hing S	cheme	Credits	Examination Marks				Total
L	Т	Р	С	Theory Marks		Practical N	Aarks	Marks
				ESE (E)	PA (M)	ESE (V)	PA (I)	
2	0	2	3	70	30	30	20	150

Sr.	Content	Total						
No.		Hrs.						
SECTION-A								
1	Basics of Computer System:							
	Concept of Hardware and Software, Computer block diagram, Input							
	Output unit, CPU, Control Unit, Arithmetic logic Unit (ALU), Memory Unit, Monitor, Printers: Dot matrix, Laser, Inkjet, Plotters, Scanner							
2	2 Software:							
	System software and Application Software, Operating system concepts,							
	purpose and functions, Installation of Linux and Windows, Operations of							
	Windows OS, Control Panel, My Computer, My Network Places							
3	Information Processing Using Open Office: Open office Writer	4						
	Calc, Impress, Draw, Base, Math							
	SECTION-B							
4	Computer and Communication: Need of Data Transmission, Data	5						
	Transmission Media, Baud rate and Bandwidth, Digital and Analog							
	Transmission, Serial and Parallel Data Transfer, Protocols, MODEM,							
	Networking of Computers, Bridges, Routers, Switch, Gate way,							



Diploma of Engineering Subject Code: MH1106 Subject Name: Basics of Computer Engineering

	Topologies: Bus, Star, Ring, Hybrid, Introduction to Ports : RS232, IEEE 488, PS2, USB, UTP									
5	Introduction to Internet: www, Web Site, URL, e-mail, e-Commerce,									
	Web browsing, Web page, Introduction to Hypertext & HTML,									
	Introduction to http & ftp Protocol									
6	Information Concepts and Security: Definition of Data, Information,									
	Need of Information, Concepts of Data Security, Privacy, Protection,									
	Computer Virus and their types, Scanning & Removing Virus									

Text Book:

1. Fundamentals Of Computers, 2nd Edition, by Reema Thareja, Oxford University Press

Reference Books:

- 1. Computer Fundamentals & Distributors , Seventh edition, by V K Jain, Standard Publications
- 2. PC Software for Windows made simple, by R. K Taxali, TMH
- 3. Introduction to Networking, by Barrey Nance, PHI
- 4. Web Based Application Development, by Ivan Beyross, TMH using HTML, DHTML, Javascript Pearl/CGI

List of Practicals:

Sr. No	Title of Experiment
1	Installation of Windows XP
2	Installation of Linux
3	Practice of Computer Booting Process in XP
4	Demonstration of Windows Environment
5	Practice of using My Computer, Windows Explorer, My Network Places
6	Practice of using Control Panel



Diploma of Engineering Subject Code: MH1106 Subject Name: Basics of Computer Engineering

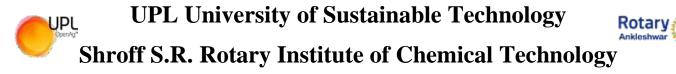
7	Searching Web Page/ Site using Search Engine
8	Creating e-mail Account, Sending and Receiving e-mails with attachment & Signature
9	Exercise Based on Open Office : Document Preparation, Work Book Preparation,
	Creating Slides
10	Creating Simple Web Page using HTML.

Course Outcomes:

Student will be able to:

Sr. No.	CO statement
CO-1	Identify the needs of hardware and software required for a computation task.
CO-2	Understands the working of important application software and their use to perform any engineering activity
CO-3	Use the software for information processing
CO-4	Describe Network & Communications tools
CO-5	Design the simple webpage.
CO-6	Explain typical provisions of cyber law that govern the proper usage of Internet and computing resources.

- Open Office
- Antivirus
- Window 8.1



Diploma Engineering Subject Code: MH1112 Subject Name: Engineering Workshop Practice

Semester: - I/I

Type of course: Engineering Science Course

Prerequisite: Zeal to learn the subject

Rationale: Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Irrespective of branch, the use of workshop practices in day to day industrial as well domestic life helps to dissolve the problems.

Teaching and Examination Scheme:

Teac	Teaching Scheme Credits			ching Scheme Credits Examination Marks				Total
L	Т	Р	С	Theory Marks		Practical N	/larks	Marks
				ESE (E)	PA (M)	ESE (V)	PA (I)	
0	0	6	3	0	0	40	60	100

Sr. No.	Content	Total Hrs.
	SECTION-A	
1	Carpentry Shop: i) Demonstration of different wood working tools / machines. ii) Demonstration of different wood working processes, like plaining, marking, chiseling, grooving, turning of wood etc. iii) One simple job involving any one joint like mortise and Tenon dovetail, bridle, half lap etc.	10
2	Fitting Shop: i) Demonstration of different fitting tools and drilling machines and power tools ii) Demonstration of different operations like chipping, filing, drilling, Lapping, sawing, cutting etc. iii) One simple fitting job involving practice of chipping, filing, drilling, tapping, cutting etc.	10
3	Welding Shop: i) Demonstration of different welding tools / machines. ii) Demonstration on Arc Welding, Gas Welding, MIG, MAG welding, gas cutting and rebuilding of broken parts with welding. iii) One simple job involving butt and lap joint	04





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Diploma Engineering Subject Code: MH1112 Subject Name: Engineering Workshop Practice

	SECTION-B	
4	Tin Smithy Shop: i) Tin smith tools like – hammers, stakes, scissors etc., ii) sheet metal operations such as shearing, bending, joining, iii) safety precautions, iv) demonstration of various operations.	10
5	Smithy Shop: i)Smithy tool like - hammer, tongs, Anvil, flattener etc., ii)Smithy operations such as upsetting, drawing down, bending, setting down, for welding, cutting, punching and fullering etc., iii) Safety precautions, iv) Demonstration of various smithy operations	04
6	Machine Shop:i) Various machining operations such as facing, centering and turning, drilling, gear cutting, ii) demonstration of different machine tools like Lathe machine, Milling machine, Shaper and drilling machine iii) General idea of cutting tools of the machines. iv) demonstration of machining operations	08

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
NA	NA	NA	NA	NA	NA

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Text Books:

- 1. **Elements of Workshop Technology** –Vol.I & II Hazara and Choudhay by Media promoters & Publisher private limited.
- 2. A Course in Workshop Technology _Vol I & II- B.S. Raghuwanshi, Dhanpat Rai and Co., New Delhi.

Reference Books:

- 1. **Comprehensive Workshop Technology** (Manufacturing Processes). S.K. Garg by Laxmi Publications.
- 2. Workshop familiarization.- E.Wilkinson by Pitman engineering craft series.
- 3. Mechanical workshop practice.- K.C. John by PHI publications
- 4. **Basic Workshop Practice Manual** T Jeyapoovan; Vikas Publishing House (P) Ltd.,New Delhi

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Diploma Engineering

Subject Code: MH1112

Subject Name: Engineering Workshop Practice

5. **Manufacturing Technology**, Vol. I and Vol. II, Rao P.N, by Tata McGraw Hill publications House

List of Practical/ tutorials:

- 1. Introduction to Mechanical Workshop
- 2. Exercise on Carpentry shop
- 3. Exercise on Fitting shop
- 4. Exercise on Tin smithy shop
- 5. Demonstration of Welding joints like Lap joint, Lap Tee joint, Edge joint, Butt joint and Corner joint.
- 6. Demonstration on Smithy shop and various smithy operations
- 7. Demonstration of Lathe Machine Tools and its components and accessories
- 8. Demonstration of Various machining operations performed on Lathe machine
- 9. Demonstration of Milling machine tool and Drilling Machine and their basic components
- 10. Demonstration of Various machining operations performed on Milling machine and Drilling Machine.

Course Outcomes:

After completion of this course students will able to

Sr. No.	CO statement
CO-1	Understand the safety measures required to be taken while working with
	machines in workshop.
CO-2	Design and model different prototypes in the carpentry trade such as Cross lap
	joint, Dove tail joint
CO-3	Design and model various basic prototypes in the trade of fitting such as
	Straight fit, V- fit
CO-4	Recognize various basic prototypes in the trade of Tin smithy such as
	rectangular tray, and open Cylinder.
CO-5	Identify various Welding joints such as Lap joint, Lap Tee joint, Edge joint,
	Butt joint and Corner joint.
CO-6	Comprehend of various machine tools and process carried out in workshop.

List of Open Source Software/learning website:

• http://nptel.iitm.ac.in/courses.php







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Shroff S.R. Rotary Institute of Chemical Technology

Diploma in Engineering Subject Code: CO1101 Subject Name: Programming in C

Semester: - II

Type of course: Engineering Core

Prerequisite: Basic knowledge of Computer.

Rationale: C is an entry-level programming language, and, in many ways, the foundation of advanced programming languages.

Teaching and Examination Scheme:

Teac	hing S	cheme	Credits	Examination Marks				Total
L	Т	Р	С	Theory Marks		Practical N	Aarks	Marks
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr.	Content	Total
No.		Hrs.
	SECTION-A	
1	Fundamentals of C	6
	Features of C language, structure of C Program, comments, header files,	
	data types, constants and variables, operators, expressions, evaluation of	
	expressions, type conversion, precedence and associativity, I/O functions.	
2	Control structure in C	7
	Simple statements, Decision making statements, Looping statements,	
	Nesting of control structures, break and continue, goto statement	
3	Array & String	7
	Concepts of array, one and two dimensional arrays, declaration and	
	initialization of arrays, string, string storage, Built-in string functions	
	SECTION-B	

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Shroff S.R. Rotary Institute of Chemical Technology

Diploma in Engineering Subject Code: CO1101 Subject Name: Programming in C

4	Functions	7
	Concepts of user defined functions, prototypes, definition of function,	
	parameters, parameter passing, calling a function, recursive function	
5	Pointers	7
	Basics of pointers, pointer to pointer, pointer and array, pointer to array,	
	function returning pointer	
	Structure	
	Basics of structure, structure members, accessing structure members,	
	nested structures, array of structures, structure and functions, structures	
	and pointers	
6	Dynamic memory allocation	5
	Introduction to Dynamic memory allocation, malloc(), calloc(), realloc(),	
	free()	
	File management	
	Introduction to file management, modes and its functions	

Text Book:

1. Programming in ANCI C, Seventh edition, by Balagarusamy E, Tata McGrawHill Publishing Company Limited

Reference Book:

- 1. Programming with C, Second edition, by Gottfried, Tata McGraw-Hill Publishing Company Limited.
- 2. Let us C, Fifth edition, by Kanetkar Y. P., BPB Publication

Practical List:

- **1.** Write a program to compute Fahrenheit from centigrade (f=1.8*c+32).
- **2.** Write a program to read three numbers from keyboard and find out maximum out of these three. (nested if else)
- **3.** Write a c program to find given no is prime or not.





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Diploma in Engineering Subject Code: CO1101 Subject Name: Programming in C

4. Write a program to print following patterns

* 1 ** 12 *** 123

- 5. Write a C program to read and store the roll no and marks of 20 students using array.
- 6. Write a program to reverse string.
- **7.** Write a C program to swap the two values using call by value and call by reference.
- 8. Write a program to find factorial of a number & Fibonacci series using recursion.
- **9.** Define a structure type struct personal that would contain person name, date of joining and salary using this structure to read this information of 5 people and print the same on screen.
- **10.** Write a program to write a string in file.

Course Outcomes:

Student will be able to:

Sr. No.	CO statement
CO-1	Demonstrate the concept of variables, data types & operators.
CO-2	Use concept of branching & looping to design efficient C programs.
CO-3	Develop an application using the concepts of array and string.
CO-4	Apply code reusability with functions.
CO-5	Implement Structure using C.
CO-6	Understand the basics of file handling mechanisms.