GANPAT UNIVERSITY
Sem-I (CE/IT/EC/BM/MC/ME/C)

HS 101: Engineering Mathematics - I

Teaching Scheme				Credit			Examination Scheme (Marks)				
							Theory			Practical / TW	Total
				Theory	Pra/ TW	Total	Int. Assess	Sem. End			
Lect Hrs	Tu Hrs	Prac. Hrs	Total					Marks	Hrs		
03	01	00	04	03	01	04	30	70	3	-	100

Unit No	Topics	Lectures (Hours)
1	**Differential Calculus** Review of the prerequisites such as limits of sequences and functions, continuity, uniform continuity and differentiability. Successive differentiation, Leibnitz's theorem, Taylor's & Maclaurin's expansions, Indeterminate forms.	9
2	**Mean value theorems** Rolle's theorem, Lagrange's Mean value theorem, Cauchy's Mean value theorem.	5
3	**Partial differentiation and its applications** Partial and total differential coefficient, Eulers theorem, Transformations, Geometrical interpretation of partial derivatives, Tangent plane and Normal line, Jacobians, Taylors expansion for two variables, Errors and approximations, Maxima and Minima of functions of two variables ,Lagranges method of undetermined multipliers to determine stationary values.	10
4	**Matrix Algebra** Elementary transformations & rank, inverse by Gauss-Jordan Method, normal form of a matrix, consistency of system of linear equations, Linear dependent and Linear independent vectors. Eigen values and eigen vector.	14
5	**Infinite Series** Definition, Comparison test, Caucheys integral test, ratio test, root test, Leibnitz rule for alternating series, power series, range of convergence, uniform convergence.	6
6	**Analytical Solid Geometry** Coordinate system, Cartesian, Cylindrical Polar and Spherical Polar (Transformation from one to another system), Quadric Surfaces and their equations	4
	Total	48

Reference Books:

(1) Higher Engineering Mathematics by Dr. B. S. Grewal
(2) Higher Engineering Mathematics Vol. I & II by Dr. K. R. Kachot.
(3) Calculus and analytical geometry by G. B. Thomas and R. L. Finney
(4) Higher Engineering Mathematics by G. C. Patel, Dr. T. A. Desai, P.A.Patel

GANPAT UNIVERSITY
SEMESTER – I/II (IT/CE/EC/BM&I/MC/ME/Civil)
HS 103: Language & Communication Skills

Teaching Scheme (Hrs.)				Credit			Examination Scheme (Marks)				
							Theory			TW/Practical	Total
Lect Hrs	Tu Hrs	Prec. Hrs	Total	Theory	Pr/TW	Total	Int. Assess	Sem. End	Hrs		
02	02	00	04	02	01	03	30	70	3	25	125

Unit No.	Topics	Lectures (Hour)
1	**Basics of Technical Communication:**	4
	Introduction to English language and communication, Principles, process and forms of communication, Role of Language in communication, Barriers to communication, Difference between general and technical communication	
2	**Listening & Reading Skills:**	4
	Listening Skill: Definition and process of listening skill, Types of listening, Modes of listening, Active listening and reflective response.	
	Reading Skill: Reading as a communicative process, Types and strategies of reading like reading for facts, guessing meanings from context, paraphrasing, scanning, skimming, inferring meaning, critical reading, Reading at various speeds (slow, fast, very fast); reading different kinds of texts for varied purposes; reading between lines, Reading of technical text	
3	**Oral Communication:**	6
	Presentation and Public Speaking: Nature of presentation, How to prepare presentation, Presentation tools along with guidelines of effective presentation, Boredom Factors in presentation and how to overcome them, Interactive presentation. Nature of public speaking, Tips for public speaking, Difference between presentation and public speaking	
	Job Interviews and Group Discussion: The interview process, Objectives of job interview, Types of interview, Characteristics of job interview, Pre-interview preparation techniques, Interview questions and answering techniques, Nature of group discussion, Characteristics of group discussion, Organizational group discussion, Group discussion as a part of selection process, group discussion strategies, Techniques for individual contribution in group discussion	
4	**Business Writing:**	5
	Business letter writing: Essentials of effective letter writing, Need, Functions and Types of business letters. Structure and Layout of a business letter, Drafting of business letters like inquiry, reply, purchase order, complaint and adjustment letter, sales promotion	
	Advertisements: Basics of advertisement, Nature and purpose of advertisement, Types of an advertisement, Media for advertisement, preparing of an advertisement draft	

5	**Professional Writing:**	5
	Report writing: Purpose of a report, types of reports**,** Structure and style of reports, Committee report, Individual report	
	Resume and job application: Significance of resume and job application, structure, types, tips for job application, Resume writing, Job application letter	
	Notice, agenda, minutes of meeting: Requisites of meeting, Types of company meetings, drafting of notice, agenda and minutes of meeting	
	Official Correspondence: Introduction, Correspondence with different authorities like government departments, civic authorities, office bearers of financial institutions, insurance agencies	
	Total	**24**

Practicals:

At least 10 Practicals shall be performed based on above course contents during the semester.

Assignments:

At least 10 Assignments shall be given periodically during the semester.

Reference Books:

(1) Technical Communication – Principles and Practice by Meenaksi Raman & Sangeeta Sharma (Oxford University Press)

(2) Effective Technical Communication by M Ashraf Rizvi (TMH Publication)

(3) Business Communication by V. K. Jain and Omprakash Biyani (S. Chand & Company)

(4) Business Correspondence and Report Writing by R. C. Sharma & Krishna Mohan (TMH Publication)

(5) A Guide to Business Correspondence and Communication skills by A. N. Kapoor (S. Chand & Company)

(6) A Communicative Grammar of English by Geoffery Leech and Fan Svartvik (Pearson Longman)

(7) New International Business English by Jones & Alexander (Oxford University Press)

GANPAT UNIVERSITY
B.Tech I/II (CE/IT/EC/BM & I/MC/ME/C)

EE 101: Elements of Electrical Engineering

Teaching Scheme (Hrs.)			Credit			Examination Scheme (Marks)				
						Theory			Practical / TW	Total
			Theory	Pr/TW	Total	Int. Assess	Sem. End			
L	P	Total					Marks	Hrs		
04	02	06	04	01	05	30	70	03	25	125

Unit No.	Topics	Lectures (Hours)
1	**D.C. Circuits :** Source Transformation, Star-Delta Transformation, Application of Kirchhoff's Law, Superposition Theorem, Thevenin's Theorem, Norton's & Maximum Power Transfer Theorem.	04
2	**Capacitor :** Types of Capacitor, Capacitance of Multiple Parallel Plate Capacitor, Energy stored in a Capacitor, Charging & Discharging of Capacitor & Time constant.	03
3	**Magnetic circuit :** Law of Magnetic Circuit , Series & parallel Magnetic Circuits and Calculation, Comparison of magnetic & Electric Circuit, Magnetization Curves.	05
4	**Electromagnetic Induction :** Review of Faraday's Law, Lenz's Law, Self & Mutual Inductance, Inductance of coupled circuits, Rise and Decay of Current in Inductive circuit & Time Constant, Magnetic Hysterisis, Hysterisis Loss, Eddy Current Loss.	06
5	**Work, Power, Energy :** Heating Effect of Electric Current and Joule's law - Thermal Efficiency- Electrical Units of Power and Energy - Mechanical Units of Force- Torque & Power - Calculation of Power & Energy - Energy Bill.	02
6	**Illumination :** Definition and important terms, Laws of illumination, Requirement of good lightning, Types and Design of lightning scheme, Street lightning , Factory and Flood lightning.	03
7	**Batteries and Cells :** Primary and Secondary cells, Lead acid, Nickel Cadmium secondary cells, Charging of Lead acid Batteries, Lithium primary and secondary cells, Dry button cells.	02
8	**A.C.Circuits :** Generation of A.C. Voltage , Equation of A.C. Voltage, Average value, R.M.S. Value, Form Factor, Peak Factor, Phase & Phase Difference, Vector Representation of A.C. Voltage and Current. Addition and Subtraction of Vectors, Mathematical Representation of Vectors, Complex Algebra, Polar & Exponential form, Pure Resistive, Pure Inductive, Pure Capacitive and combination of R-L-C Circuits, Active -Reactive and Apparent power & Power Factor, Resonance in R-L-C Series Circuit, Q-factor, Bandwidth, Solution of Parallel circuit by Admittance, Phasor & Complex Algebra methods, Resonance in Parallel circuit, Q-factor, Bandwidth.	12
9	**3-Phase Circuits :** Generation of 3-phase voltage, Phase Sequence , Interconnection of three	03

	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.	
10	**Economic Aspects :** Load curve and related factors, Tariff & its types, Causes and effects of low power factor, Methods of improving power factor.	**03**
11	**Measuring Instrument :** Operating system of Indicating instrument, Constructional and working of PMMC, Moving Iron, Dynamometer instruments, shunts and multiplier, multimeter and megger.	**03**
12	**Safety & Protection :** Safety, electric shock, first aid for electric shock other hazards of electrical laboratories & safety rules, circuit protection devices, fuses, MCB, ELCB & relays	**02**
	Total	**48**

Laboratory work

At least 10 Practicals to be performed based on above syllabus.

Tutorials

At least 10 Assignments and Tutorials to be solved.

Reference Books:

(1) Electrical Technology Volume-I by B.L.Thereja, Pub. By S.Chand

(2) Elements of Electrical & Electronics Engineering by U.A.Patel , Pub. By Atul Prakashan

(3) Basic Electrical Engineering by V.N.Mittal Pub. By Tata Mc Grawhill, New Delhi

(4) Electrical Wiring ,Estimating and Costing by S.L.Uppal, By Khanna Publication

(5) Principles of Power Systems by V.K.Mehta Pub. By S.Chand

GANPAT UNIVERSITY
B.Tech I/II (CE/IT/EC/BM & I/MC/ME/C)

ME 101: Elements of Mechanical Engineering

Teaching Scheme			Credit			Examination Scheme					
						Theory				Practical	Grand Total
							Sem. End			Pract./ TW Assessment	
Lect. (Hrs.)	Pract. (Hrs.)	Total (Hrs.)	Theory	Pr/TW	Total	Int. Asses.	Marks	Hrs.	Total		
4	2	6	4	1	5	30	70	3	100	25	125

Unit No.	Topics	Lectures (Hours)
1	**Introduction:** Prime movers, Sources of energy, Types of prime movers, Force and mass, Pressure, Work, Power, Energy, Heat, Temperature, Units of heat, Specific heat capacity, Interchange of heat, Change of state, Mechanical equivalent of heat, Internal energy, Enthalpy, Entropy, Efficiency, Statements of Zeroth Law, First law and Second Law of Thermodynamics.	04
2	**Fuels and Combustion:** Introduction, Classification, Solid fuels, Liquid Fuels, Gaseous fuels, LPG,CNG and biofuels ,Calorific values.	02
3	**Properties of gases :** Gas laws, Boyle's law, Charle's law, Combined gas law, Gas constant, Internal energy, Relation between Cp and Cv, Enthalpy, Non flow process, Constant volume process, Constant pressure process, Isothermal process, Poly-tropic process, Adiabatic process.	05
4	**Properties of Steam :** Introduction, Steam formation, Types of Steam, Enthalpy, Specific volume of steam and dryness fraction of steam , Internal energy, Steam tables, Non-flow process. Measurement of dryness fraction, Throttling calorimeter, Separating calorimeter, Combined calorimeter.	05
5	**Heat Engines:** Thermal prime movers, Elementary heat engines, Sources of heat, Working substances, Converting machines, Classification of heat engines.	03
6	**Steam Boilers :** Introduction, Classification, Simple vertical boiler, Vertical multitubular boiler, Cochran type, Lancashire boiler, Locomotive boiler, Babcock and Wilcox boiler, Boiler details, Boiler performance. Functioning of different mountings and accessories.	05
7	**Internal Combustion Engines :** Introduction, Classification, Engine details, otto four-stroke cycle, Diesel-four-stroke cycle, Difference between otto cycle and Diesel cycle, Two-stroke cycle, Difference between two-stroke and four-stroke cycle, indicated power (ip), Brake Power (bp), Efficiencies.	06
8	**Speed Control:** Introduction, Governors, I.C. Engine governing, Fly wheel.	02
9	**Pumps:** Introduction, Reciprocating pump, types and operation, Air Chamber, Centrifugal pumps, Priming, Positive displacement pumps.	04
10	**Air Compressors:** Introduction, Uses of Compressed air, Reciprocating compressors, Operation of a compressor, Work for compression, Power required, Reciprocating compressor efficiency, Multistage reciprocating compressors, Rotary compressors.	03

11	**Refrigeration & Air Conditioning:** Introduction, Refrigerant, Types of refrigerators, Vapour compression refrigerating system, Window and split air conditioners.	03
12	**Couplings, Clutches and Brakes:** Introduction, Couplings, Clutches, Brakes, Types of brakes. Difference between a brake and a clutch.	03
13	**Transmission of Motion and Power:** Introduction, Methods of drive, Power transmission elements, shaft and axle, Belt-drive, Pulleys, Power transmitted by a belt, Chain drive, Friction drive, Gear drive.	03
	Total	48

Reference Books:
1. Thermal Science and Engineering by Dr. D.S. Kumar, S.K. Kataria & sons Publication New Delhi

2. Fundamental of Mechanical Engineering by G.S. Sawhney, Prentice Hall of India Publication

New Delhi

3. Thermal Engineering by R.K. Rajput ,S.Chand Publication New Delhi

GANPAT UNIVERSITY
B.Tech I/II (CE/IT/EC/BM & I/MC/ME/C)

CI 102: Mechanics of Solids

Teaching Scheme				Credit			Examination Scheme					
							Theory				Practical	Grand Total
							Int. Asses.	Sem. End			Pract./ TW Assessment	
Lect. (Hrs.)	Tu Hrs	Pract. (Hrs.)	Total (Hrs.)	Theory	Pr/TW	Total		Marks	Hrs.	Total		
04	00	02	06	04	01	05	30	70	03	100	25	125

Unit No.	Topics	Lectures (Hours)
1	**Introduction:-** Scalar and vector quantities, absolute and derived units, the science of mechanics, fundamental principles, SI units.	1
2	**Forces & Force Systems:-** Force and force systems, composition and resolution of forces, moment of a force, law of parallelogram, resultant of different force systems, Varignon's principle..	6
3	**Equilibrium:** Equilibrium of a particle, resultant and equilibrant, free body and free body diagram, Lami's theorem, equilibrium of human body joints.	3
4	**Centre of gravity and Moment of Inertia:-** Center of gravity of curves, plane areas and bodies, Pappus Guldinus theorem I & II, method of integration, Area moment of inertia, mass moment of inertia, M.I. of flywheel, different methods of M.I., law of parallel axis, law of perpendicular axis.	8
5	**Friction:-** Theory of friction, Types of friction, inclined plane friction, ladder friction, wedge friction, belt and rope friction.	3
6	**Simple Lifting Machines:-** Velocity ratio, mechanical advantage, efficiency, reversibility, law of machines, simple wheel & axle, differential wheel & axle, single purchase crab winch, differential wheel & axle, pulley & pulley block.	3
7	**Dynamics of Particles:-** De-Alembert's principle, motion of connected bodies, motion along inclined planes, impulse and momentum, Single degree free vibration	4
8	**Physical and Mechanical properties of materials:** Properties related to axial, bending and torsional and shear loading, Toughness, hardness ,proof stress, factor of safety, working stress, load factor.	3
9	**Stresses & Strains:-** Elastic, homogeneous, isotropic materials, limit of elasticity and proportionality, yield limit, ultimate strength, strain hardening, section of composite materials, prismatic and non prismatic sections. Strains: Linear, shear,lateral,thermal and volumetric, Poisson's ratio. Stresses: Normal stresses, axial- tensile and compressive, shear and complementry shear, thermal and hoop. Applications to composite material stepped and tapered bars.	7

10	**Beams:-** Types of supports, Types of beams, Types of loads, determinate andindeterminate beams. .Bending moments and Shear force , Bending moment and shear force diagrams for statically determinate beams subjected to couples, connected forces, uniformly distributed loadings, relation between bending moment, shear force and rate of loading, point of contra flexture.	10
	Total	48

Reference Books:

(1) Engineering Mechanics by Beer & Johnston
(2) Applied Mechanics by S.B.Junarkar & H. J. Shah
(3) Mechanics of Structure Vol. I by S.B.Junarkar & H. J. Shah
(4) Engineering Mechanics by M.N.Patel
(5) Engineering Mechanics by P.J.Shah
(6) Engineering Mechanics by A. K. Tayal
(7) Engineering Mechanics by S. Ramamrutham
(8) Engineering Mechanics by Kumar
(9) Strength of Materials by Timo Shenko
(10) Strength of Materials by S. Ramamrutham

GANPAT UNIVERSITY
B.Tech I/II (CE/IT/EC/BM & I/MC/ME/C)

CI 103: Environment Study & Disaster Management

Teaching Scheme				Credit			Examination Scheme						
							Theory					Practical	Grand Total
								Sem. End				Pract./ TW Assessment	
Lect. (Hrs.)	Tu	Pract. (Hrs.)	Total (Hrs.)	Theory	Pr/TW	Total	Int. Asses.	Marks	Hrs.	Total			
04	00	00	04	04	00	04	30	70	03	100		00	100

Unit No.	Topics	Lectures (Hours)
1	**Introduction to Environment:** Definition, Inter-relationships amongst and between them, Components of Environment, Relationship between different components, Man-Environment relationship Impact of Technology on the environment, Environmental Degradation.	4
2	**Ecology & Ecosystems:** Introduction: Ecology- Objectives and Classification, Concepts of an ecosystem- structure & function of ecosystem, Components of ecosystem- Producers, Consumers, Decomposers, Bio-Geo- Chemical Cycles- Hydrological Cycle, carbon cycle, Oxygen Cycle, Nitrogen Cycle, Sulfur Cycle, Energy Flow in Ecosystem, Food Chains: Grazing, Detritus, & Food webs, Ecological Pyramids, Major Ecosystems: Forest Ecosystem, Grassland Ecosystem, Desert Ecosystem, Aquatic ecosystem, Estuarine Ecosystem.	8
3	**Environmental Pollution:** **Air Pollution:** Composition of air , Structure of atmosphere, Ambient Air Quality Standards, Classification of air pollutants, Sources of common air pollutants like SPM, SO2, NOX – Natural & Anthropogenic Sources, Effects of common air pollutants, Carbon credit. **Noise Pollution:** Introduction- Sources of Noise Pollution, Ambient noise levels, Effects of noise pollution on human being and wild life, Noise pollution controls, Noise standards. **Water Pollution:** Introduction – Water Quality Standards, Sources of Water Pollution, Classification of water pollutants, Effects of water pollutants, Eutrophication. **Current Environmental Global Issues:** Global Warming & Green Houses Effects, Acid Rain, Depletion of Ozone Layer**.**	8
4	**Energy Resources:** **Renewable & Nonrenewable Resources:** Renewable Resources, Nonrenewable Resources, Destruction versus Conservation. **Energy Resources:** Energy Resources - Indian Scenario , Conventional Energy Sources & its problems, non-conventional energy sources- Advantages & its limitations , Problems due to Overexploitation of Energy Resources.	4
5	**Natural Disasters:** Introduction, Floods, Earthquakes and Landslides, Cyclones and Thunderstorms, Tsunami, Drought, Heat wave and Sandstorms	8

6	**Man made Disasters:** War and Terrorism, Riots and Demonstrations, Residential and Industrial Fires, Transportation Accidents, Nuclear Power Accidents, Hazardous Materials and Toxic Emission, Utility Failure.	7
7	**Problems regarding victims and its awareness:** Saving Victims – First Twenty-Four Hours, Conducting Medical Relief Operations, Managing Relief Operations, Psychological Issues, Carrying Out Rehabilitation Work	6
8	**Planning for disaster management:** Local Disaster Management Cell, How to Prepare a Business Recovery Plan?, Government Response in Disaster.	3
	Total	48

NOTE: It is necessary to include mock drill, field visit and expert lectures in the portion of Disaster Management. The format of the question paper in the portion of Disaster Management should be objective with short answer questions, multiple choice questions etc.

REFERENCE BOOKS:

1. Citizen's guide to disaster management   by Satish Modh Publisher:-Macmillan Publishers India,

2. Environment Engineering Vol-I & II, by Dr.S.K.Garg,

3. Introduction to Air Pollution, by R.K.Trivedi & P.K.Goel.-BS Publications,

4. Environmental Pollution Control Engineering, by C.S.Rao,

5. Vol-I- Air Pollution, Vol-II- Water Pollution, Vol-V- Noise Pollution – By S.K.Agarwal – A.P.H.Publishing Corporation,

6. Environmental Studies: R. Rajagopalan,Oxford University Press

7. Environmental Pollution: Causes, Effects & Control by K.C Agrawal

8. Environmental Science by Richard T Wright & Bernard J Nebel

9. Environmental Science by Daniel B Botkin & Edward A Keller

10. Environmental Engineering & Management by Suresh K Dameja

11. Environmental Management by Dr. Swapan C Deb

12. Environment & Ecology by Dr Gourkrishna Dasmohapatra

13. Introduction to Environmental Engineering and Science by Master Gilbert M.