

SVKM's Narsee Monjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. Integrated (all branches)				Semester: I	
Course/Module: Mathematics-I				Module Code: 701BS0C004	
Teaching Scheme			Evaluation Scheme		
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
3	0	1	4	Marks Scaled to 50	Marks Scaled to 50
Course Objectives					
The course aims to acquaint students with different aspects of mathematics that are used in daily life and particularly in science, engineering and technology. It further promotes a clear frame of mind to think, analyze and articulate logically so as to develop an interest in students to study mathematics as a discipline.					
Course Outcomes					
After completion of the course, students would be able to					
<ol style="list-style-type: none"> 1. define and relate basic notions of sets, relations and functions, 2. apply basic facts, concepts and principles of trigonometry to solve problems, 3. evaluate limits and examine continuity of a function, 4. find the derivatives of elementary functions. 					
Detailed Syllabus: (per session plan)					
Unit	Description				Duration
1.	Logarithms Definition; Laws of logarithms; Change of base.				3
2.	Sets Sets and their representations; Empty set; Finite and infinite sets; Equal sets; Subsets; Subsets of a set of real numbers especially intervals (with notations); Power set; Universal set; Venn diagrams; Union and Intersection of sets; Difference of sets; Complement of a set; Properties of complement.				5
3.	Relations and Functions Relation - Ordered pairs; Cartesian product of two sets; Cardinal number; Domain, Range, and Co-domain of a relation. Functions - Function as a special type of relation; Domain, Codomain, Range, Algebra of real valued functions, Representation of functions - Types of function - One to one function, Many to one function, Onto function, Into functions, Even and odd functions, Equal functions, Composite functions; Graphs of standard real valued functions - constant, identity, modulus, exponential, logarithmic, polynomial and rational functions.				7



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Mukesh Patel School of Technology Management & Engineering**

4.	Trigonometry Concept of angles; Measurement of angles in degrees, radians and their conversions; Trigonometric functions; Sign of trigonometric functions; Domain and range of trigonometric functions; Addition and subtraction formulae; Trigonometric functions of allied angles (without proof); Trigonometric functions of multiple angles, sub-multiple angles ($2A$, $3A$, $A/2$).	10
5.	Limit and Continuity Limits Definition; Algebra of limits; Limits based on formula; Limits of algebraic functions – method of factorization and rationalization; Limits of trigonometric functions; Limits of exponential and logarithmic functions; Limit at infinity. Continuity Continuity of a function at a point; Left hand limit, right hand limit, Continuity of some standard functions; Discontinuous function.	12
6.	Differentiation Definition, Few examples of differentiation by definition, List of derivatives of standard functions, Derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions; Derivatives of composite functions (Chain rule)	8
	Total	45

Text Books

1. Mathematics Textbook for Class XI, NCERT Publication, 2019 Edition (Unit 2, Unit 3, Unit 4, Unit 5, Unit 6)
2. Mathematics Part I Textbook for Class XII, NCERT Publication, 2019 Edition (Unit 3, Unit 5, Unit 6)

Reference Books

1. H. K. Dass, "Applied Mathematics for polytechnics", CBS Publishers & Distributors Pvt. Ltd., 11th edition 2016.
2. H. R. Hass, C. E. Heil, M. D. Weir, Thomas' "Calculus", Pearson, 14th edition 2017.

Any other information

Total Marks of Internal Continuous Assessment (ICA) : 50 Marks

Distribution of ICA Marks

Description of ICA	Marks
Class Test	20
Term Work	30
Total Marks	50

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SVKM's Narsee Monjee Institute of Management Studies
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Program: B. Tech. Integrated (all branches)				Semester: I	
Course/Module: Physics-I				Module Code: 701BS0C005	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
3	2	0	4	Marks Scaled to 50	Marks Scaled to 50

Course Objectives:

Physics is the science from which all technologies have evolved. Engineers deal with various technologies which eventually leads to new innovations and improvements. This course is designed to impart a thorough knowledge of the basic principles along with the applied aspects of the same, which help students to understand, apply and contribute to evolving technologies more effectively and thereby improve the standard of life and the society.

Course Outcomes:

After completion of the course, students would be able to

1. explain basic laws and related formulae for understanding the relationship between nature and matter on scientific basis, (level I, II)
2. classify and utilize international system of units (SI Units), symbols, nomenclature of physical quantities and formulations, conventions, (Level III and IV)
3. interpret and apply concepts of physics in daily life with reasoning while decision-making and solving engineering problems, (Level II and III)
4. analyze the concepts of Physics related to various natural phenomena and demonstrate them by handling tools and instruments in the lab. (level II and V)

Detailed Syllabus: (per session plan)

Unit	Description	Duration
1.	Physical world and measurements Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures. Dimensions of physical quantities, dimensional analysis and its applications.	9
2.	Kinematics Motion in a Straight Line , The frame of reference, Motion in a straight line: Position-time graph, speed and velocity. Elementary concepts of differentiation and integration for describing motion, uniform and non-uniform motion, average speed and instantaneous velocity, uniformly accelerated motion, velocity-time	10

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SVKM's Narsee Monjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

	and position-time graphs. Relations for uniformly accelerated motion (graphical treatment). Motion in a Plane , Scalar and vector quantities; Position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors, relative velocity, Unit vector; Resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors. Motion in a plane, cases of uniform velocity and uniform acceleration-projectile motion, uniform circular motion.	
3.	Laws of motion Laws of Motion , Intuitive concept of force, Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion. Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces, Static and kinetic friction, laws of friction, rolling friction, lubrication. Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on a banked road).	9
4.	Work energy and power Work is done by a constant force and a variable force; kinetic energy, work-energy theorem, power. The notion of potential energy, the potential energy of a spring, conservative forces: conservation of mechanical energy (kinetic and potential energies); non-conservative forces: motion in a vertical circle; elastic and inelastic collisions in one and two dimensions.	8
5.	Motion of system of partials and rigid bodies Centre of a mass of a two-particle system, momentum conservation and center of mass motion. Centre of a mass of a rigid body; the center of mass of a uniform rod. Moment of a force, torque, angular momentum, law of conservation of angular momentum and its applications. Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions. Moment of inertia, a radius of gyration, values of moments of inertia for simple geometrical objects (no derivation). Statement of parallel and perpendicular axes theorems and their applications.	9
	Total	45

Text Books

1. Text Book of Physics for Class XI (Part-I, Part-II); N.C.E.R.T., Delhi. (Unit 3, Unit 4, Unit 5, Unit 6, Unit 7)
2. Principles of Physics by P.V. Naik, Pearson Education Pvt. Ltd, New Delhi, 5th edition 2012. (Unit 1, Unit 2, Unit 4)



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**SVKM's Narsee Monjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering**

Reference Books

1. Halliday and Resnick, "Fundamentals of Physics", Wiley India, 8th edition 2008.
2. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd., New Delhi, 2011.

Any other information

Total Marks of Internal Continuous Assessment (ICA) : 50 Marks

Distribution of ICA Marks

Description of ICA	Marks
Class Test	20
Term Work	30
Total Marks	50



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SVKM's Narsee Monjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. Integrated (all branches)				Semester: I	
Course/Module: Chemistry-I				Module Code: 701BS0C006	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks - 100 in Question Paper)
3	2	0	4	Marks Scaled to 50	Marks Scaled to 50
Prerequisite: 10 th Standard Science					
Course Objectives The objective of this course is to introduce the basic principles of chemistry including atom structure, gas laws, acids & bases, and also familiarize with the concepts and applications of water technologies, engineering materials and understand electrochemistry.					
Course Outcomes After completion of the course, students would be able to					
<ol style="list-style-type: none"> 1. explain the fundamental structure of atom, which governs the properties of matter, 2. apply the different gas laws and derive relationships between the pressure, volume, temperature and number of moles of a gas, 3. analyze the fundamentals of water purification technologies applied in industries and solve numerical on Acid & Bases, 4. evaluate the principles of engineering materials and the principles of electrochemistry in various real time problems. 					
Detailed Syllabus: (per session plan)					
Unit	Description				Duration
1.	Atom Structure Dalton's Atomic Theory, Rutherford's Scattering Experiment, Bohr's Theory of an atom, Orbits and orbitals, shapes of s, p, d orbitals, Pauli's exclusion principle, Hund's rule, Aufbau principle, Electronic configuration of first twenty elements.				7
2.	Gas Laws Ideal and real gases, Gas pressure units, and numericals based on it, Gas laws-Boyle's Charles, Ammonton's law, Avogadro's law-numericals based on it, ideal gas equation, determining density and molecular weight of a gas, volume of gases in chemical reactions.				7
3.	Water Sources of water, Impurities in water, hardness of water, causes of hardness, Numerical problems based on hardness calculations,				8

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	Disadvantages of hard water – for domestic and industrial purposes (scales & sludge, caustic embrittlement, priming & foaming). Municipal water treatment (in brief only) – sedimentation, coagulation, filtration, sterilization.	
4.	Engineering Materials Natural occurrence of metals – minerals, ores of iron, aluminium and copper, gangue (matrix), flux, slag, metallurgy – brief account of general principles of metallurgy. Alloys – definition, purposes of alloying, ferrous alloys and non-ferrous with suitable examples, properties and applications. Portland Cement (Setting & Hardening).	8
5.	Electrochemistry Introduction of Electrochemistry, Line notation, Redox reaction, Definition of electrolytes and non electrolytes. Mechanism of electrolysis. Faraday's Laws of Electrolysis-Statements and numerical problems. Applications of electrolysis (electro refining & electroplating)	8
6.	Acids & Bases Theories of Acids and bases-Arrhenius theory, Bronsted-Lowry concept, Lewis theory, advantages of Lewis concept, Concept of pH, pH scale, buffers. Numerical problems based on hydrogen ion and hydroxyl ion concentration.	7
	Total	45

Text Books

1. Text Book of Chemistry for Class XI; N.C.E.R.T., Delhi, 2018-19 (Part I, Unit -2,5,7)
2. Text Book of Chemistry for Class XII; N.C.E.R.T., Delhi, 2018-19(Part I, Unit -3)
3. Jain.P.C & Jain.M, Engineering Chemistry, Dhanpat Rai Publishing Co. New Delhi, 17th Edition, 2017.(Chapter -14,17)

Reference Books

1. Ball. D, "Physical Chemistry", Cengage Learning Inc, 2nd edition, 2015.
2. Weiner.S.A, Harrison.B, "Introduction to Chemical Principles-A Laboratory Approach", Cengage Learning, 7th edition 2010.

Any other information

Total Marks of Internal Continuous Assessment (ICA) : 50 Marks

Distribution of ICA Marks

Description of ICA	Marks
Class Test	20
Term Work	30
Total Marks	50



Signature

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SVKM's Narsee Monjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. Integrated (all branches)				Semester: I	
Course/Module: Engineering Drawing				Module Code: 701ME0C003	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorials (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks - 50 in Question Paper)
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50
Course Objectives					
This course is aimed at providing the knowledge about engineering drawing and its place in the society. The main purpose to study the Orthographic and Isometric projection is to develop the visual aspects of 2D and 3D drawing by using CAD modelling software. The course is also delineated to emphasize the concepts of projections of points, lines and planes, including basic concept of free hand sketches of engineering elements.					
Course Outcomes					
After completion of the course, students would be able to					
<ol style="list-style-type: none"> 1. apply the techniques, skills, and modern tools to create Orthographic and Isometric projections of machine components, 2. analyse the concepts of the projections of points, lines and planes, 3. generate free hand sketches of Engineering Elements. 					
Detailed Syllabus: (per session plan)					
Unit	Description				Duration
1.	Basic elements of Drawing Drawing Instruments and supporting materials: method to use them with applications. Convention of lines and their applications. Scales: Representative Fractions- reduced, enlarged and full size scales. Engineering Dimensioning techniques- types and applications of chain, parallel and coordinate dimensioning. Geometrical and Tangency constructions.				4
2.	Computer aided drafting interface Computer Aided Drafting: concept. Hardware and various CAD software available. System requirements and Understanding the interface.				4

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	Draw basic entities like Line, Circle, Arc, Polygon, Ellipse, Rectangle, Multiline and Polyline. Modify and edit commands like trim, extend, delete, copy, offset, array, block, layers. Dimensioning: Linear, Horizontal Vertical, Aligned, Rotated Baseline, Continuous, Diameter, Radius, and Angular Dimensions. Dim scale variable. Editing dimensions. Text: Single line Text, Multiline text.	
3.	Projections of Lines and Planes Introduction to projections of points. Projections of lines: Introduction, lines inclined to one plane. Projections of planes: Introduction, types of planes, plane surface inclined to one plane.	4
4.	Orthographic projections Introduction of projections -Types of Projections, First angle and Third angle method, their symbols. Introduction to Orthographic Projection. Conversion of pictorial view into Orthographic Views (use First Angle Projection method only).	7
5.	Isometric Projections Introduction to isometric projection. Isometric scale and Natural scale. Conversion of orthographic views into isometric view/projection.	7
6.	Free Hand Sketches of Engineering Elements Free hand sketches of machine elements: Thread profiles, nuts, bolts, studs, set screws, washer. Types of nuts, bolts, screws, studs and riveted joints. (For branches other than mechanical Engineering, the teacher should select branch specific elements for free hand sketching)	4
	Total	30

Text Books

1. N. D. Bhatt, "Elementary Engineering Drawing", Charotar Publishing House, 2016.
2. M. B. Shah and B. C. Rana, "Engineering Drawing", Pearson Education, 2nd Edition 2014.

Reference Books

1. K. Venugopal, "Engineering Drawing and Graphics", New Age International Publishers, 2007.
2. D. M. Kulkarni., A.P. Rastogi, A. K. Sarkar, "Engineering graphics with AutoCAD", Printer Hall India Publisher, 2009.



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Mukesh Patel School of Technology Management & Engineering**

Any other information

Total Marks of Internal Continuous Assessment (ICA) : 50 Marks

Distribution of ICA Marks

Description of ICA	Marks
Class Test	20
Term Work	30
Total Marks	50

Details of Term Work

1. Minimum 6 drawing sheets (AutoCAD based).
2. Minimum 2 drawing assignments based on Unit 1 and 5.
3. Practical Examination / Quiz.
4. Complex drawing on advance Machine elements like couplings, joints etc.



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SVKM's Narsee Monjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. Integrated (all branches)				Semester: I	
Course/Module: Mechanical Workshop				Module Code: 701ME0C004	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorials (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
0	2	0	1	Marks Scaled to 50	--
Course Objectives Impart hands-on experience in performing mechanical operations like fitting, welding, sheet metal, and plumbing. Ensure implementation of safety measures for the operator, equipment and product in all operations to develop the knowledge of standard practices of the workshop trades.					
Course Outcomes After completion of the course, students would be able to <ol style="list-style-type: none"> 1. understand Safety and modern Industry practices, 2. differentiate various tools used in workshop for fitting, welding and sheet metal fabrication, 3. differentiate various tools used in workshop for plumbing operation in G.I. and PVC pipe. 					
Detailed Syllabus: (per session plan)					
Unit	Description				Duration
1.	Introduction to various workshop trades, layout. General instructions for safety in various Workshop Trades. Common accidents- causes and preventive measures. First Aid.				2
2.	Introduction to Workshop Trades and Safety Measures Fitting Shop: Introduction to fitting shop tools, common materials used in fitting shop. Description and demonstration of various types of safety precaution while work on benches, holding devices, files and hack-sawing. Welding Shops: Introduction to welding and its importance in engineering practice; Welding screens and other welding related equipment, accessories and gloves. Safety precautions during welding. Hazards of welding and its remedies. Precautions while using electric arc welding, Practice in setting current and voltage for striking proper arc. Earthing of welding machine.				14

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	<p>Sheet Metal Fabrication: Use of hand tools for sheet metal fabrication. Sheet metal fabrication of jobs involving cutting, shearing, bending, edge folding, soldering, brazing etc.</p> <p>Demonstration of modern tools.</p> <p>Carpentry Shop: Demonstration of power tools and equipment for carpentry, safety practices and general guidelines.</p>	
3.	<p>Descriptions and drawing of various plumbing shop tools such as Pipe Dies, Wrenches, Threading dies and Pipe Vices. Safety precautions while handling plumbing tools.</p> <p>Demonstration and practice of Pipe Fittings such as Sockets, Elbow, Tee, Reducer, Nipple, Union coupling, plug, Bend, Float valves and Taps</p>	4
4.	<p>List different sizes of Galvanized Iron (G.I.) and flexible pipe used for fitting. List different adhesive solvent used for fitting.</p> <p>Introduction to various types of threads (internal and external)-single start, multi-start, left hand and right hand threads. Observe the operation threading to G.I. pipe with jointing & jointing of PVC pipe.</p> <p>Practice for actual pipe line by using PVC pipe and accessories without using adhesive.</p> <p>Practice for actual G.I. pipe with socket, plug, and elbow, with operation of cutting, threading and fitting.</p>	10
	Total	30

Text Books

1. K. C. John, "Mechanical Workshop Practice", PHI Learning Pvt. Ltd., 2nd edition 2010.

Reference Books

1. Hajra Choudhary S. K., Bose S. K., Hajra Choudhary A. K., Roy Nirjhar, "Elements of Workshop Technology-I", Media promoters and Publications, 2013.

Any other information

Total Marks of Internal Continuous Assessment (ICA): 50 Marks

Distribution of ICA Marks

Description of ICA	Marks
Class Test	NA
Term Work	50
Total Marks	50


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SVKM's Narsee Monjee Institute of Management Studies
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Program: B. Tech. Integrated (all branches)				Semester: I	
Course/Module : Preparatory Course in English				Module Code: 701BS0C007	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
1	2	0	2	Marks Scaled to 50	—

Course Objectives

Linguistic competence plays a very significant role in an individual's overall development as well as professional development. As such, the objectives of this course are to broaden and deepen students' abilities to read, think, and articulate their thoughts through writing and speech. The course will also enhance students' ability to engage in dialogue, to listen and speak effectively.

Course Outcomes

After successful completion of this course, students would be able to

1. read, comprehend and respond critically to extended texts,
2. write grammatically correct, meaningful, complete written responses,
3. communicate confidently using the English language in formal and informal settings.

Detailed Syllabus: (per session plan)

Unit	Description	Duration
1.	Reading <ul style="list-style-type: none"> • Exposure to different styles and genres of writing such as descriptive, fictional, analytical and scientific • Reading strategies such as close reading, critical reading and appreciative reading • Vocabulary enhancement • Critical evaluation - understanding author intention, drawing inferences, appreciation of literary style 	5
2.	Writing <ul style="list-style-type: none"> • Principles of written communication and the 7C's • Outlining, idea expansion, sentence construction, paragraph writing • Grammar and punctuation 	5
3.	Listening and Speaking	5



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	<ul style="list-style-type: none"> • Understanding Audiences, Context and Medium • Listening – Types of listening, Barriers to effective listening • Dialogue – Importance of attention, listening and effective speaking • Persuasive Communication 	
	Total	15

Text Books

1. Meenakshi Raman and Sangeeta Sharma, "Technical Communication" New Delhi: Oxford University Press, (2015 3rd Ed. 2017 Reprint) (Unit 1, Unit 2, Unit 3, Unit 4)

Reference Books

1. Anjanees Sethi and Bhavana Adhikari, "Business Communication", Tata McGraw Hill. 2010
2. Courtland Bovee and John Thill, "Business Communication Today", Pearson Education, 14th edition 2017.

Suggested Readings for Comprehension

1. Murty S., A Lesson in life from a beggar, In *Wise and otherwise*, New Delhi: Penguin, 2006.
2. Narayan, R. K., A Hero, In *Swami and Friends*, New Delhi: Penguin, 1980/2000.
3. Nehru, J., The Quest of man, In *Letters from a father to his daughter*, New Delhi: Penguin, 1929/2004.
4. Snowden, E., Incomplete, In *Permanent Record*, London: Pan Books, 2020.

Any other information

Innovative Activity/Mini-project

Students in groups of 5 will interview a community helper or a service provider and understand their work and life. The class will make and publish interviews as a podcast series

Total Marks of Internal Continuous Assessment (ICA) : 50 Marks

Distribution of ICA Marks

Description of ICA	Marks
Class Test	20
Term Work	30
Total Marks	50

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