

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

Program: B. Tech. Integrated (Civil Engineering)				Semester : III	
Course/Module: Construction Materials				Module Code: BTICI03001	
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

Outcomes:

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

- Differentiate various building materials in terms of their types, properties, defects, processes and uses
- Describe various manufacturing processes of various building materials.
- Justify the applications of different building materials in construction

Detailed Syllabus: (Per session plan)

Unit	Description	Duration
1.	Requirements of Building Materials and Products: Functional, Aesthetical and Economical. Study of Properties of Materials: Physical, Mechanical, Chemical, Biological and other Engineering Properties.	05
2.	Materials for masonry work: Stones - Types, Properties, Testing, Qualities of Good Stones, Quarrying, Surface Finishing, Preservative Treatments. Brick and concrete blocks - manufacturing process, qualities, properties, Testing and uses. Miscellaneous materials - Siporex blocks, fly ash blocks, (manufacturing process, properties and civil engineering uses) etc.	07
3.	Binder Material: Lime, Cement - types, properties, manufacturing process, testing and Manufacturing Process, Mortar and concrete - Ingredients, Types and Uses, Grouts.	07
4.	Steel: Types - mild steel, cast iron, wrought iron, stainless steel, TOR steel, galvanised iron, etc. Different forms of steel used in construction - bars, flats, structural steel sections, hot rolled, cold formed, etc.	05

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5.	Timber: General, classification, structure, qualities of good timber, defects in timber, strength of timber, decay of timber, preservative treatment and wood composites	08
6.	Flooring and Roofing Materials: Types of floor finishes, suitability, Types of Roofing materials, suitability.	02
7.	Paints and Varnishes: Types, constituents, methods, defects and uses	02
8.	Construction Chemicals: Water proofing and termite proofing materials, Chemicals for concrete Repairs, Concrete Admixtures, Sealants	04
9.	Miscellaneous Materials: Glass: types and uses, plastic, fibre-reinforced concrete, asphalt, bitumen, micro silica, PVC, Plaster of Paris, non-ferrous metals	05
	Total	45

Text Book:

1. S. K. Duggal, "Building Materials", *New Age International*, 2009

Reference Books:

1. P.C. Varghese, "Building Materials", *PHI Learning Pvt. Ltd.*, 2005.
2. S.C. Rangawala, "Engineering Materials", *Charotar Publishing House Pvt. Ltd.*, 2012.

Any other information: NIL

Details of Internal Continuous Assessment (ICA)

Test Marks: 20

Term Work Marks: 30

Details of Term work:

Term work should consists of the following:

1. Minimum eight assignments covering the prescribed syllabus.
2. Report of minimum six experiments performed from the list given below:
 - Physical tests on cement (Fineness, consistency, setting time, compressive strength, soundness test)
 - Tests on bricks (Compressive strength test and water absorption test)
 - Tests on siporex block (Compressive strength test and water absorption test)

TBB



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- Tests on concrete block (Compressive strength test and water absorption test)
- Tests on timber (Compressive strength test parallel to grains and perpendicular to grain, moisture content test, flexural strength test)
- Tests on tile (Flexural strength test, water absorption test)
- Tests on fine aggregates (Bulking, silt content, water absorption, specific gravity)
- Tests on coarse aggregates (Water absorption, specific gravity)



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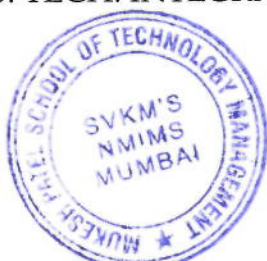
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Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. Integrated (Civil Engineering)				Semester : III	
Course/Module: Construction Engineering				Module Code: BTICI03002	
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	2	4	Marks Scaled to 50	Marks Scaled to 50
Objectives: <ul style="list-style-type: none"> To impart the knowledge of various construction processes To know the manufacturing processes of various building materials To impart knowledge about application of building materials in construction 					
Outcomes: After completion of this course, students would be able to: <ol style="list-style-type: none"> Differentiate various building materials in terms of their types, properties, defects, processes and uses Describe various manufacturing processes of various building materials. Justify the applications of different building materials in construction 					
Detailed Syllabus: (Per session plan)					
Unit	Description				Duration
1.	Types of Structures: Load bearing & Framed structures, their suitability and economic aspects, introduction to building components				04
2.	Foundations: Functions, Requirements, Types – strip footings, columns footings, isolated and combined, raft foundations, pile foundations, well foundation and cessions.				08
3.	Masonry Constructions: Stone Masonry - Types, Joints, Lifting appliances, Permissible loads, Supervision during construction, Maintenance Brick Masonry - Terminology, Art of brick laying, tools for brick works, Bonds, Junctions, Typical structural members in brickworks, columns/piers, footings, thresholds, jambs, window sills, corbels, Defects in brick masonry, Supervision of brick masonry works, Comparison of brick masonry and stone masonry Composite Masonry- Stone composite masonry, Brick-Stone composite masonry. Reinforced brick masonry and Concrete block masonry				12

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	Masonry Finishes - Plastering, Pointing, Painting and Other Decorative finishes	
4.	Reinforced Cement Concrete: Grades of Concrete and steel, ingredients, mixing, types of mixers, transportation and placement, compaction, types of vibrators, curing, various methods for curing. Formwork - materials used, requirements and design considerations, centering and scaffolding, types and material used.	07
5.	Floors and Roofs: Floors - Construction of ground floor and Upper floors, floor finishing - types and methods. Roofs - Features of good roofs, Classification of roofs, wooden and steel trusses, Roof covering, Drainage	04
6.	Doors and Windows: Terminology, types, suitability, approximate sizes, fixtures and fittings.	04
7.	Staircases: Types, terminology, types, requirements, geometric design, Ramps, Escalators, Lifts	04
8.	Shotcrete and grouting: Process, equipment used	02
	Total	45

Text Book:

1. P.C. Varghese, "Building Construction", PHI Learning Pvt. Ltd., 2007.

Reference Books:

1. Don Arthur Watson, "Construction Materials and Processes", Tata McGraw Hill , 2007.
2. S.C. Rangawala, "Building Construction", Charotar Publishing House Pvt. Ltd., 2009.



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Any other information: NIL

Details of Internal Continuous Assessment (ICA)

Test Marks: 20

Term Work Marks: 30

Details of Term work:

Term work should consists of the following:

1. Minimum five assignments covering the prescribed syllabus.
2. Minimum eight A3 size drawing sheets indicating details of various building components



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Program: B. Tech. Integrated (Civil & Mechanical Engg.)				Semester : III	
Course/Module: Engineering Mechanics				Module Code: BTICI03003	
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	2	4	Marks Scaled to 50	Marks Scaled to 50

Outcomes:

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

- Determine moment of inertia for plane areas
- Analyse pin jointed frames
- Evaluate the velocity, acceleration and displacement of a moving body
- Analyse the forces developed on the moving body

Detailed Syllabus: (Per session plan)

Unit	Description	Duration
1.	Moment of inertia of plane areas: Moment of inertia of plane areas, parallel axis theorem. Introduction to polar moment of inertia, product of inertia and mass moment of inertia.	04
2.	Analysis of pin jointed plane frames: Perfect truss, method of joints, and method of section.	06
3.	Forces in space: Rectangular components of forces in space, resultant of concurrent forces, moment of a forces about a point and a given axis, resultant of general force system, Equilibrium of a particle in space.	07
4.	Principle of virtual work: Application to determine the reactions of determinate beams with/ without internal hinges	04
5.	Kinematics of particle: Motion along plane curved path, tangential and normal component of acceleration, simple harmonic motion. Kinematics of rigid bodies: Translation, pure rotation and plane motion of rigid bodies, instantaneous centre of rotation for the velocity for bodies in plane motion, link mechanisms (upto two links).	10
6.	Kinetics of particles: Newton's laws of motion, D'Alembert's principle, equation of dynamic equilibrium, linear motion, curvilinear motion. Kinetics of rigid bodies: D'Alembert's principle for bodies under translational motion, rotational motion about a fixed axis and plane motion Application to motion of bars, cylinders, spheres.	08



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7.	Energy and momentum principles: Work done by a force, potential and kinetic energy, power, work energy equation, principle of conservation of energy, momentum, principle of conservation of momentum, impact of solid bodies, elastic impact, semi-elastic impact and plastic impact.	06
	Total	45
Text Book: <ol style="list-style-type: none"> 1. N. H. Dubey (2014), "Engineering Mechanics", Tata McGraw Hill 2. R. C. Hibbler (2004), "Engineering Mechanics", McMillan Publishers 		
Reference Books: <ol style="list-style-type: none"> 1. F. L. Singer (1954), "Engineering Mechanics", Harper & Row Publication (Classic book) 2. Beer & Johnson (2011), "Engineering Mechanics", Tata McGraw Hill 3. D. S. Kumar (2009), "Engineering Mechanics", Tata McGraw Hill 4. Macklin & Nelson (2012), "Engineering Mechanics", Tata McGraw Hill 5. A. K. Tayal (2008), "Engineering Mechanics", Umesh Publication 6. E. W. Nelson, Charles L. Best, W.G. Mclean, Merle Potter (2010), "Schaum's outlines on Engineering Mechanics -Statics", Tata McGraw Hill 		
Any other information: NIL		
Details of Internal Continuous Assessment (ICA) Test Marks: 20 Term Work Marks: 30		
Details of Term work: Term work should consists of the following: <ol style="list-style-type: none"> 1. Minimum eight assignments covering the prescribed syllabus. 		

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Program : B. Tech. Integrated (All Branches)				Semester : III	
Course/Module: Engineering Mathematics-I				Module Code : BTICI03004	
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	2	4	Marks Scaled to 50	Marks Scaled to 50

Objectives:

- To impart knowledge of complex numbers and its applications to solve Engineering problems.
- To provide an understanding of principles of vector algebra, single variable and multivariable calculus.

Outcomes:

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

- Understand the concepts of complex numbers, hyperbolic functions, Mean value theorems and vector products to solve Engineering problems.
- Express functions in series using Taylor's and Maclaurin's expansions, and evaluate limits of indeterminate forms using L' Höspital's Rule.
- Find partial derivatives of functions and carry out the knowledge to error and approximations, maxima and minima.
- Apply the concepts such as gradient, directional derivative, curl and divergence to solve real life problems.

Detailed Syllabus: (Per session plan)

Unit	Description	Duration
8.	Complex Numbers: Introduction to complex numbers, modulus and amplitude of a complex number, Argand's diagram, cartesian, polar and exponential forms of a complex number. Algebra of complex numbers: equality, addition, subtraction, multiplication and division. De-Moivre's theorem, Roots of complex numbers, Euler's form of circular functions, Hyperbolic functions, relation between circular and hyperbolic functions.	12
9.	Mean value theorems, Series expansion and Indeterminate forms: Rolle's theorem, Lagrange's mean value theorem, Cauchy's mean value theorem.	10

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	Taylor's formula, Maclaurin's series. Indeterminate forms: $\frac{0}{0}, \frac{\infty}{\infty}, 0 \times \infty, \infty - \infty, 0^0, \infty^0, 1^\infty$ by L'Hôpital's rule.	
10.	Partial Derivatives and its applications: Partial Derivatives of two and three variable functions, Partial derivative of composite function, Homogeneous functions in two or three variables, Euler's theorem, error and approximations, Maxima and Minima in 2 variables by second derivative test.	13
11.	Vectors: Scalar and vector triple products, Product of four vectors, curves in space, Differentiation of a vector function of a single scalar variable, Theorems on derivatives, concept of tangent vector, scalar and vector point functions, gradient, directional derivative, Curl and Divergence, Irrotational and Solenoidal Fields.	10
	Total	45

Text Book:

1. Erwin Kreyszig (2010), "Advanced Engineering Mathematics", Wiley Eastern Ltd, 10th edition.

Reference Books:

1. Andreescu Titu, Andrica Dorin (2014), Complex Numbers from A to ... Z, Birkhäuser Basel Publishers, 2nd edition.
2. Thomas, Calculus (2014), Pearson Education, 7th edition.
3. Howard Anton (2012), "Calculus", Wiley, 10th edition.
4. B. V. Ramana (2010), "Higher Engineering Mathematics", Tata McGraw Hill, 1st edition.
5. Alan Jeffrey (2003), Handbook of Mathematical Formulas and Integrals, Academic Press, 3rd edition.

Any other information: NIL

Details of Internal Continuous Assessment (ICA)

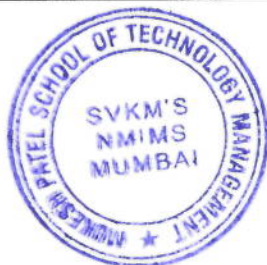
Test Marks: 20

Term Work Marks: 30

Details of Term work: As per institute norms



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Program: B. Tech. Integrated (Mechanical, Civil, Computer & EXTC)				Semester: III	
Course/Module: Engineering Chemistry				Module Code: BTICI03005	
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)
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50
Objectives <ol style="list-style-type: none"> 1. To introduce basic principles of chemistry such as functional group identification, properties of solutions, and reaction stoichiometry. 2. To familiarize the concepts and applications of fuels, polymers, and e-waste management. 					
Outcomes: After completion of the course, students would be able to: <ol style="list-style-type: none"> 1. Identify different functional groups of compounds and various organic reactions associated with it. 2. Identify the importance of various classes of polymers and applications in daily life. 3. Classify different types of fuels and lubricants based on their properties and applications; 4. Recognize the importance of e-waste management with respect to environment and health hazards and solve numerical problems based on atom economy and distinguish the various formula applied to different types of solutions; interpret reaction stoichiometry and solve numerical problems. 					
Detailed Syllabus: (per session plan)					
Unit	Description				Duration
1.	Organic Reactions: Reactions of functional groups: those containing oxygen (-COOH, -OH, -CHO, -C=O); Nucleophilic substitution reaction, Elimination reaction Organic Name Reactions E.g. Aldol & related reactions.				06
2.	Solutions and Stoichiometry: Types of solutions and its characteristics, properties of aqueous solutions, different units for expressing concentration of solutions (ppm, ppb, normality, molarity, molality, mole fraction of solute, mass fraction of solute and solvent), empirical and molecular formula from elemental composition, numerical based on empirical formula, normality, molarity, molality molarity.				06
3.	Fuels & Combustion: Definition, Classification, characteristics. Calorific Value-Theoretical				06

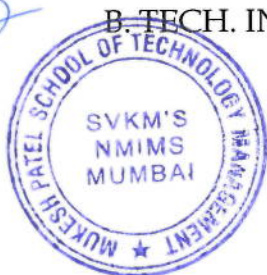
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	& Experimental (Bomb calorimeter). Solid Fuels: Coal, proximate and ultimate analysis, Numerical based on analysis of coal. (Dulong formula) and bomb calorimetry. Liquid fuels: Mining of Petroleum, Cracking, Reforming, Knocking in IC engines, anti-knocking agents (TEL and MTBE),	
4.	Lubricants: Definition, Mechanism of lubrication, Properties- viscosity, viscosity index, flash & fire, cloud & pour points, oiliness, saponification & acid value (numericals based on saponification and acid value)	04
5.	Polymers: Introduction and definition of important terms - monomer, polymer, polymerization, degree of polymerization, tacticity, and melting-glass transition temperature. Some commercially important polymers (PP, PVC). Plastics: Thermosetting & Thermoplastics, Compounding of plastics, Preparation, properties and applications of commercial plastics (Rubber, Phenol formaldehyde resin).	05
6.	Environmental Aspects of Chemistry: i) Green Chemistry: Principles of Green Chemistry with examples (Numerical Problems on Atom economy) ii) E-waste management: Definition, classification and management of e-waste.	03
	Total	30
Text Books: <ol style="list-style-type: none"> 1. Abhijit Mallick; Chemistry for Engineers, Viva books, 2nd Edition 2017. 2. Palanna.O.G., Engineering Chemistry, Tata McGraw Hill Education. Pvt. Ltd, 2nd Edition 2017. 3. Samir Sarkar; Fuels & Combustion, Orient Longman Pvt. Ltd 3rd Edition 2009. 		
Reference Books: <ol style="list-style-type: none"> 1. R.T. Morrison & R. N. Boyd, Organic Chemistry, Prentice Hall, 8th Edition 2016. 2. Johrie. R.; E-waste, TERI Press, 2009. 3. Paul C. Hiemenz & Timothy P. Lodge; Polymer Chemistry, CRC Press, 2nd Edition 2007. 		
Any other information: NIL Details of Internal Continuous Assessment (ICA) Test Marks: 20 Term Work Marks: 30		

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Details of Term work:

Term work should consists of the following:

1. Minimum Eight Lab experiments to be taken.
2. Unit wise assignments to be taken.
3. Presentation/Viva-voce/Quiz to be conducted.



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Program: B. Tech. Integrated (All Branches)				Semester : III	
Course/Module: Constitution of India				Module Code : BTICI03006	
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 - -- in Question Paper)
2	0	0	0	Marks Scaled to 50	-----
Objective: <ul style="list-style-type: none">To understand the basic aspects of the constitution of India, the evolution, the directive principle & important provisions.To understand the implications of important constitutional provision on Business and Professionals.					
Outcomes: After completion of this course, students would be able to: <ul style="list-style-type: none">Learn basic aspects of constitution of India.Apply Constitutional provision on Business and their Professionals.					
Detailed Syllabus: (Per session plan)					
Unit	Description				Duration
1.	The Constitution, its evolution and Preamble to the Constitution.				04
2.	Fundamental rights and duties, exceptions with examples, individual responsibilities and duties, application to business.				10
3.	Directive principles of State Policy, its emphasis and its impact as related to business.				04
4.	Indian Judiciary and LokAdalats.				06
5.	Emergency Provisions under Article 352 – 360.				04
6.	Voting behaviour in India and present political scene. Responsibility of Business in relation to the Constitution.				02
	Total				30
Text Books: 1. Durga Das Basu (2009), “Indian Constitution”, 20 th Edition.					

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Reference Books:

1. N. A. Palkhiwala (2009), "We the People".
2. Justice Hidayatullah (2009), "Indian Constitution".

Any other information: NIL

Details of Internal Continuous Assessment (ICA)

Test Marks: 20

Term Work Marks: 30

Details of Term work:

Term work should consists of the following:

1. Assignments / Case studies.
2. Two class tests.



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