

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

<b>Program: MBA. Tech. (I.T., EXTC, Mechanical, Computer, Chemical)</b>					<b>Semester: II</b>	
<b>Course/Module: Mathematics-II</b>					<b>Module Code: MBIT02008, MBET02008, MBME02008, MBCO02008, MBCH02008</b>	
<b>Teaching Scheme</b>					<b>Evaluation Scheme</b>	
<b>Classroom Session</b>	<b>Lecture (Hours per week)</b>	<b>Tutorial (Hours per week)</b>	<b>Practical/ Group work (Hours per week)</b>	<b>Credit</b>	<b>Internal Continuous Assessment (ICA) (Marks - 50)</b>	<b>Term End Examinations (TEE) (Marks - 100 in Question Paper)</b>
<b>45</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Marks Scaled to 50</b>	<b>Marks Scaled to 50</b>
<b>Course Rationale:</b> This course is designed to develop the concepts and methods related to Multivariate Integration, Ordinary Differential Equations and Functions of Complex Variables. Double Integrals, Triple Integrals, Line and Surface Integrals are all powerful tools for real world applications. Mathematical models of real world problems often involve Differential Equations. Approach to the solution of such equations is discussed in the course. The course also explores Analytic and Harmonic Functions, Conformal Mappings, Contour Integration, Cauchy Integral Formula and evaluation of Definite and Improper Integrals.						
<b>Course Objectives:</b> <ol style="list-style-type: none"> <li>1. To familiarize prospective engineers with techniques in Multivariate Integration, Ordinary Differential Equations and Complex Variables.</li> <li>2. To enable students to deal with advanced levels of Mathematics and applications that would be essential for their disciplines.</li> </ol>						
<b>Course Outcomes:</b> After completion of the course, students would be able to: <ol style="list-style-type: none"> <li>1. Understand and apply appropriate mathematical techniques in evaluating Multiple Integrals, Differentiation and Integration of Functions of Complex Variables.</li> <li>2. Use effective mathematical tools for the solutions of ordinary differential equations that model physical processes.</li> <li>3. Apply various techniques of Multivariable Integration, Differential Equations and Complex Analysis in solving engineering problems.</li> </ol>						
<b>Pedagogy:</b> Lectures, tutorials, presentations, application-based videos and use of mathematical software.						
<b>Textbooks:</b> TB1. <i>Advanced Engineering Mathematics</i> , 10 e, Erwin Kreyszig, Wiley India, 2017. TB2. <i>Engineering Mathematics – I</i> , 1 e, Veerarajan T, McGraw-Hill Education, 2017. TB3. <i>Higher Engineering Mathematics</i> , 44 e, B.S. Grewal, Khanna Publishers, 2017. TB4. <i>Engineering Mathematics – II</i> , 1 e, Veerarajan T, McGraw-Hill Education, 2017.						
<b>Reference Books:</b> RB1. <i>Calculus and Analytic geometry</i> , 9 e, G. B. Thomas and R. L. Finney, Pearson, 2006. RB2. <i>Elementary Differential Equations and Boundary Value Problems</i> , 9 e, W. E. Boyce and R. C. DiPrima, Wiley India, 2015.						

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RB3. *Differential Equations*, 3 e, S.L. Ross, Wiley India, 2016.

RB4. *Complex Variables and Applications*, 8 e, J.W. Brown and R.V. Churchill, Mc- Graw Hill Education, 2014.

RB5. *A text book of Engineering Mathematics*, 9 e, N. P. Bali and Manish Goyal, Laxmi Publications (P) LTD., 2017.

**Links to websites:**

- <http://mathworld.wolfram.com>
- <http://www.math.com>
- <https://ocw.mit.edu/index.htm>

**Evaluation Scheme:**

• Tutorial Test/Presentation/viva/quiz	30%
• Mid Term	20%
• Term End Exam	50%
<b>Total</b>	<b>100%</b>

**Session Plan:**

Session	Topics	Pedagogical Tool	Textbook Chapters & Readings
Unit 1	Multivariate Integration	--	--
1.	<b>Multiple Integration</b> <ul style="list-style-type: none"><li>• Double integrals (Cartesian)</li></ul>	<ul style="list-style-type: none"><li>• Lecture</li><li>• Problem Solving</li></ul>	<b>TB2:</b> Chapter 4: Multiple Integrals <b>TB3:</b> Chapter 7: Multiple Integrals and Beta and Gamma functions
2.	<b>Multiple Integration</b> <ul style="list-style-type: none"><li>• Change of order of integration in double integrals</li><li>• Change of variables (Cartesian to polar).</li></ul>		
3.	<b>Applications</b> <ul style="list-style-type: none"><li>• areas and volumes</li></ul>		
4.	<b>Applications</b> <ul style="list-style-type: none"><li>• Centre of mass and Gravity (constant and variable densities).</li></ul>		
5.	<b>Triple Integration</b> <ul style="list-style-type: none"><li>• Triple integrals (Cartesian), orthogonal curvilinear coordinates.</li></ul>	<ul style="list-style-type: none"><li>• Lecture</li><li>• Problem Solving</li><li>• Presentations involving videos</li></ul>	
6.	<b>Triple Integration</b> <ul style="list-style-type: none"><li>• (contd.)</li></ul> Triple integrals (Cartesian), orthogonal curvilinear coordinates.		
7.	<b>Applications</b> <ul style="list-style-type: none"><li>• Simple applications involving cubes, sphere and rectangular parallelopeds.</li></ul>		

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8.	<b>Applications</b> <ul style="list-style-type: none"> <li>(contd.) Simple applications involving cubes, sphere and rectangular parallelopeds.</li> </ul>		
9.	<b>Scalar line integrals</b> <ul style="list-style-type: none"> <li>Definition and examples of scalar line integrals</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> </ul>	<b>TB3:</b> Chapter 8: Vector Calculus and its Applications
10.	<b>Vector surface integrals</b> <ul style="list-style-type: none"> <li>Definition and examples of vector surface integrals</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> <li>Presentations involving videos</li> </ul>	
11.	<b>Theorems on Integrals</b> <ul style="list-style-type: none"> <li>Theorems of Green, Gauss and Stokes.</li> </ul>		
<b>Unit 2</b>	<b>First order ordinary differential equations</b>	--	--
12.	<b>Exact and linear differential equations</b> <ul style="list-style-type: none"> <li>Solving Exact and linear differential equations.</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> </ul>	<b>TB1:</b> Chapter 1: First order ODEs <b>TB2:</b> Chapter 5: Differential Equations <b>TB3:</b> Chapter 11: Differential Equations of first order
13.	<b>Euler's equations</b> <ul style="list-style-type: none"> <li>Solving Euler's equations.</li> </ul>		
14.	<b>Euler's equations</b> <ul style="list-style-type: none"> <li>Solving Euler's equations.</li> </ul>		
15.	<b>Equations not of first degree</b> <ul style="list-style-type: none"> <li>Equations solvable for p</li> </ul>		
16.	<b>Equations not of first degree</b> <ul style="list-style-type: none"> <li>Equations solvable for y, equations solvable for x and Clairaut's type.</li> </ul>		
17.	<b>Equations not of first degree</b> <ul style="list-style-type: none"> <li>(contd.) Equations solvable for y, equations solvable for x and Clairaut's type.</li> </ul>		
<b>Unit 3</b>	<b>Ordinary differential equations of Higher order</b>	--	--
18.	<b>Second order linear differential equations</b> <ul style="list-style-type: none"> <li>Solving second order linear differential equations with variable coefficients.</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> </ul>	<b>TB1:</b> Chapter 2: Second Order Linear ODEs Chapter 3: Higher Order Linear ODEs

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			<b>TB2:</b> Chapter 5: Differential Equations <b>TB3:</b> Chapter 13: Linear Differential Equations
19.	<b>Second order linear differential equations</b> <ul style="list-style-type: none"> <li>(contd.) Second order linear differential equations with variable coefficients.</li> </ul>		<b>TB1:</b> Chapter 2: Second Order Linear ODEs Chapter 3: Higher Order Linear ODEs <b>TB2:</b> Chapter 5: Differential Equations <b>TB3:</b> Chapter 13: Linear Differential Equations
20.	<b>Higher order linear differential equations</b> <ul style="list-style-type: none"> <li>Method of variation of parameters.</li> </ul>		<b>TB1:</b> Chapter 2: Second Order Linear ODEs Chapter 3: Higher Order Linear ODEs <b>TB3:</b> Chapter 13: Linear Differential Equations
21.	<b>Higher order linear differential equations</b> <ul style="list-style-type: none"> <li>Cauchy-Euler equation</li> </ul>		<b>TB3:</b> Chapter 13: Linear Differential Equations
22.	<b>Higher order linear differential equations</b> <ul style="list-style-type: none"> <li>Power series solutions.</li> </ul>		<b>TB1:</b> Chapter 5: Series solution of ODEs and Special Functions <b>TB3:</b> Chapter 16: Series solutions of differential equations and special functions
23.	<b>Higher order linear differential equations</b> <ul style="list-style-type: none"> <li>Legendre polynomials.</li> </ul>		
24.	<b>Bessel functions</b> <ul style="list-style-type: none"> <li>Bessel functions of the first kind and their properties.</li> </ul>		
25.	<ul style="list-style-type: none"> <li><b>Bessel functions</b> (contd.) Bessel functions of the first kind and their properties.</li> </ul>		
<b>Unit 4</b>	<b>Complex Variables: Differentiation</b>	--	--
26.	<b>Complex Differentiation</b> <ul style="list-style-type: none"> <li>Differentiation</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem</li> </ul>	<b>TB1:</b>

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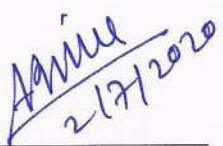
	<ul style="list-style-type: none"> <li>Cauchy-Riemann equations</li> </ul>	Solving	Chapter 3: Complex Numbers and functions and Complex Differentiation <b>TB3:</b> Chapter 20: Calculus of Complex functions <b>TB4:</b> Chapter 3: Analytic Functions
27.	<b>Complex Differentiation</b> <ul style="list-style-type: none"> <li>analytic functions</li> </ul>		
28.	<b>Complex Differentiation</b> <ul style="list-style-type: none"> <li>Harmonic functions</li> <li>finding harmonic conjugate</li> </ul>		
29.	<b>Elementary analytic functions</b> <ul style="list-style-type: none"> <li>Elementary analytic functions (exponential, trigonometric, logarithm) and their properties</li> </ul>		
30.	<b>Elementary analytic functions</b> <ul style="list-style-type: none"> <li>(contd.) Elementary analytic functions (exponential, trigonometric, logarithm) and their properties</li> </ul>		
31.	<b>Conformal Mapping</b> <ul style="list-style-type: none"> <li>Conformal mappings: Definition and problems</li> </ul>		
32.	<b>Mobius transformation</b> <ul style="list-style-type: none"> <li>Mobius transformation and their properties.</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> </ul>	<b>TB3:</b> Chapter 20: Calculus of Complex functions
33.	<b>Mobius transformation</b> <ul style="list-style-type: none"> <li>(contd.) Mobius transformations and their properties.</li> </ul>		
<b>Unit 5</b>	<b>Complex Variables: Integration</b>	--	--
34.	<b>Contour Integrals</b> <ul style="list-style-type: none"> <li>Definition and problems on Contour integrals</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> </ul>	<b>TB1:</b> Chapter 14: Complex Integration <b>TB3:</b> Chapter 20: Calculus of Complex functions <b>TB4:</b> Chapter 4: Complex Integration
35.	<b>Contour Integrals</b> <ul style="list-style-type: none"> <li>Cauchy-Goursat theorem (without proof).</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> </ul>	
36.	<b>Contour Integrals</b> <ul style="list-style-type: none"> <li>Cauchy Integral formula (without proof)</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> </ul>	
37.	<b>Contour Integrals</b> <ul style="list-style-type: none"> <li>Liouville's theorem and Maximum-Modulus theorem (without proof).</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> </ul>	

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38.	<b>Taylor's and Laurent's series</b> <ul style="list-style-type: none"> <li>Taylor's series, zeros of analytic functions</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> </ul>	<b>TB1:</b> Chapter 15: Power Series, Taylor Series Chapter 16: Laurent Series, Residue Integration
39.	<b>Taylor's and Laurent's series</b> <ul style="list-style-type: none"> <li>singularities</li> <li>Laurent's series.</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> </ul>	
40.	<b>Residues</b> <ul style="list-style-type: none"> <li>Residues</li> <li>Cauchy Residue theorem (without proof)</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> </ul>	<b>TB1:</b> Chapter 16: Laurent Series, Residue Integration
41.	<b>Evaluation of definite integrals</b> <ul style="list-style-type: none"> <li>Evaluation of definite integral involving sine and cosine.</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> </ul>	
42.	<b>Evaluation of improper integrals</b> <ul style="list-style-type: none"> <li>Evaluation of certain improper integrals using the Bromwich contour.</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Problem Solving</li> </ul>	
43,44, 45	Beyond classroom activities; including remedial lectures, guest lectures and other extension activities.		

  
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(Prepared by Concerned Faculty/HOD)



  
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(Approved by Dean)

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<b>Program: MBA. Tech. (I.T., EXTC, Mechanical, Computer, Chemical)</b>					<b>Semester: II</b>	
<b>Course/Module: Basic Electrical Engineering</b>					<b>Module Code: MBIT02009, MBET02009, MBME02009, MBCO02009, MBCH02009</b>	
<b>Teaching Scheme</b>					<b>Evaluation Scheme</b>	
<b>Classroom Session</b>	<b>Lecture (Hours per week)</b>	<b>Tutorial (Hours per week)</b>	<b>Practical/ Group work (Hours per week)</b>	<b>Credit</b>	<b>Internal Continuous Assessment (ICA) (Marks - 50)</b>	<b>Term End Examinations (TEE) (Marks - 100 in Question Paper)</b>
<b>45</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>5</b>	<b>Marks Scaled to 50</b>	<b>Marks Scaled to 50</b>
<b>Course Rationale:</b> This course aims to develop an understanding of analysis techniques applied to dc and ac circuits. It enhances the understanding of electrical and magnetic circuits through the study of basic concepts of electric and magnetic circuits, various theorems and electrical quantities.						
<b>Course Objectives:</b> <ol style="list-style-type: none"> <li>1. Equip the student to understand and solve simple ac and dc electrical and magnetic circuits using different theorems.</li> <li>2. To enable the student to obtain a basic understanding of the working principle and applications of motors.</li> <li>3. To impact hands-on experience in assembling and testing of circuits.</li> </ol>						
<b>Course Outcomes:</b> After completion of the course, students would be able to: <ol style="list-style-type: none"> <li>1. Analyze dc circuits using network theorems.</li> <li>2. Understand and analyze AC circuits.</li> <li>3. Discuss the working principle and applications of transformer, DC and AC machines.</li> <li>4. Understand the concepts of power converter and electrical installation.</li> </ol>						
<b>Pedagogy:</b> <ol style="list-style-type: none"> <li>1. Classroom lectures and discussion.</li> <li>2. Learning through conducting laboratory experiments and in-class problem solving.</li> <li>3. Using the flipped classroom technique for participative learning.</li> <li>4. Peer to Peer learning</li> </ol>						
<b>Textbook:</b> TB1. <i>Basic Electrical Engineering</i> , 1 e, D. C. Kulshreshtha, Tata McGraw Hill, 2009. TB2. <i>Electrical and Electronics Technology</i> , 10 e, E. Hughes, Pearson Education, 2013. TB3. <i>Power Electronics: Circuits, Devices and Applications</i> , 3 e, M. H. Rashid, Pearson Education India, 2009.						
<b>Reference Books:</b> RB1. <i>Electrical Engineering Fundamentals</i> , 2 e, V. D. Toro, Prentice Hall India, 2010.						

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RB2. <i>Fundamentals of Electrical Engineering and Electronics</i> , 1 Multicolor e, (Reprint 2009), B. L. Theraja, S. Chand & Co., 2006.			
<b>Links to websites:</b>			
<ul style="list-style-type: none"> <li>• <a href="http://www.nptel.ac.in">www.nptel.ac.in</a></li> </ul>			
<b>Evaluation Scheme:</b>			
• Tutorial Test/ Presentation/viva/quiz		30%	
• Mid Term		20%	
• Term End Exam		50%	
<b>Total</b>		<b>100%</b>	
<b>Session Plan:</b>			
Session	Topics	Pedagogical Tool	Textbook Chapters & Readings
<b>Unit 1</b>	<b>DC Circuits</b>	--	--
1.	Electrical circuit elements (R, L and C), voltage and current sources	Class room discussion.	<b>TB1:</b> Chapter 2: Ohms law
2.	Kirchhoff's current law	Flipped Classroom using videos from <a href="http://nptel.ac.in/courses/108108076">nptel.ac.in/courses/108108076</a>	<b>TB1:</b> Chapter 3: Network analysis <b>TB2:</b> Chapter 3: Simple DC circuits
3.	Kirchhoff's voltage laws	Flipped Classroom using videos from <a href="http://nptel.ac.in/courses/108108076">nptel.ac.in/courses/108108076</a>	<b>TB1:</b> Chapter 3: Network analysis <b>TB2:</b> Chapter 3: Simple DC circuits
4.	Analysis of simple circuits with dc excitation	Classroom discussion and numerical solving.	<b>TB1:</b> Chapter 3: Network analysis <b>TB2:</b> Chapter 3: Simple DC circuits
5.	Superposition Theorem	<ul style="list-style-type: none"> <li>• Classroom discussion and numerical solving.</li> <li>• Laboratory experiment for verification of Superposition Theorem.</li> </ul>	<b>TB1:</b> Chapter 4: Network theorems <b>TB2:</b> Chapter 4: Network theorem

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6.	Thevenin's Theorems.	<ul style="list-style-type: none"> <li>Classroom discussion and numerical solving.</li> <li>Laboratory experiment for verification of Thevenin's Theorem.</li> </ul>	<b>TB1:</b> Chapter 4: Network theorems <b>TB2:</b> Chapter 4: Network theorem
7.	Norton's Theorems.	<ul style="list-style-type: none"> <li>Classroom discussion and numerical solving.</li> <li>Laboratory experiment for verification of Norton's Theorem.</li> </ul>	<b>TB1:</b> Chapter 4: Network theorems <b>TB2:</b> Chapter 4: Network theorem
8.	Time-domain analysis of first-order RL circuits.	Peer Instructions using videos from nptel.ac.in	<b>TB1:</b> Chapter 8: DC Transients
9.	Time-domain analysis of first-order RC circuits	Peer Instructions using videos from nptel.ac.in	<b>TB1:</b> Chapter 8: DC Transients
<b>Unit 2</b>	<b>AC Circuits</b>	--	--
10.	Representation of sinusoidal waveforms, peak and rms values	<ul style="list-style-type: none"> <li>Flipped classroom using videos from nptel.ac.in/courses/108108076</li> <li>Demonstration of AC waveform parameters in laboratory</li> </ul>	<b>TB1:</b> Chapter 9: Alternating voltage and currents <b>TB2:</b> Chapter 9: Alternating voltage and current
11.	Phasor representation, real power, reactive power, apparent power, power factor.	Classroom discussion	<b>TB1:</b> Chapter 9: Alternating voltage and currents <b>TB2:</b> Chapter 9: Alternating voltage and current
12.	Analysis of single-phase ac circuits consisting of R, L and C circuits	<ul style="list-style-type: none"> <li>Classroom discussion and numerical solving.</li> <li>Laboratory experiment on <math>1\Phi</math> R,L,C circuits</li> </ul>	<b>TB1:</b> Chapter 10 : AC circuits <b>TB2:</b> Chapter 10 : Single phase Series circuits Chapter 12: Power in AC Circuits

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13.	Analysis of RL, RC circuits	<ul style="list-style-type: none"> <li>Classroom discussion and numerical solving.</li> <li>Laboratory experiment on <math>1\Phi</math> RL and RC circuits</li> </ul>	<b>TB1:</b> Chapter 10: AC circuits <b>TB2:</b> Chapter 10: Single phase Series circuits Chapter 11: Single phase Parallel Networks Chapter 12: Power in AC Circuits
14.	Analysis of series and parallel RLC circuits	<ul style="list-style-type: none"> <li>Classroom discussion and numerical solving.</li> <li>Laboratory experiment on <math>1\Phi</math> RLC resonant circuits</li> </ul>	<b>TB1:</b> Chapter 10: AC circuits <b>TB2:</b> Chapter 10: Single phase Series circuits Chapter 11: Single phase Parallel Networks Chapter 12: Power in AC Circuits
15.	Resonance (series resonant circuit)	Classroom discussion	<b>TB1:</b> Chapter 11: Resonance in ac circuits <b>TB2:</b> Chapter 14: Resonance in AC Circuits
16.	Resonance (Parallel resonant)	<ul style="list-style-type: none"> <li>Classroom discussion</li> <li>Laboratory experiment on Parallel RLC resonant circuits</li> </ul>	<b>TB1:</b> Chapter 11: Resonance in ac circuits <b>TB2:</b> Chapter 14: Resonance in AC Circuits
17.	Three-phase balanced circuits, voltage and current relations in star and delta connections.	Flipped classroom using videos from <a href="https://nptel.ac.in/courses/108108076">nptel.ac.in/courses/108108076</a> .	<b>TB1:</b> Chapter 12: Three phase circuits and systems
<b>Unit 3</b>	<b>Transformers</b>	--	--
18.	Magnetic materials, BH characteristics	Peer Instructions using videos from <a href="https://nptel.ac.in/courses/108108076">nptel.ac.in/courses/108108076</a> .	<b>TB1:</b> Chapter 13: Transformers <b>TB2:</b> Chapter 34: Transformers

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19.	Ideal and practical transformer, equivalent circuit	Peer Instructions using videos from <a href="https://nptel.ac.in/courses/108108076">nptel.ac.in/courses/108108076</a> .	<b>TB1:</b> Chapter 13: Transformers <b>TB2:</b> Chapter 34: Transformers
20.	Losses in transformers, regulation and efficiency	Peer Instructions using videos from <a href="https://nptel.ac.in/courses/108108076">nptel.ac.in/courses/108108076</a> .	<b>TB1:</b> Chapter 13: Transformers <b>TB2:</b> Chapter 34: Transformers
21.	Regulation and efficiency	<ul style="list-style-type: none"> <li>Peer Instructions using videos from <a href="https://nptel.ac.in/courses/108108076">nptel.ac.in/courses/108108076</a>.</li> <li>Laboratory experiment to determine regulation and efficiency of transformer</li> </ul>	<b>TB1:</b> Chapter 13: Transformers <b>TB2:</b> Chapter 34: Transformers
22.	Auto-transformer	Classroom discussion	<b>TB1:</b> Chapter 13: Transformers <b>TB2:</b> Chapter 34: Transformers
23.	Three-phase transformer connections	Classroom discussion	<b>TB1:</b> Chapter 13: Transformers <b>TB2:</b> Chapter 34: Transformers
24.	Three-phase transformer connections (cont.)	Classroom discussion	<b>TB1:</b> Chapter 13: Transformers <b>TB2:</b> Chapter 34: Transformers
<b>Unit 4</b>	<b>Electrical Machines</b>	--	--
25.	Generation of rotating magnetic fields	Flipped classroom using videos from <a href="https://nptel.ac.in/courses/108108076">nptel.ac.in/courses/108108076</a> .	<b>TB1:</b> Chapter 14: Alternators and synchronous motors <b>TB2:</b> Chapter 36: AC Synchronous Machine Windings
26.	Generation of rotating magnetic fields (Cont.)	Flipped classroom using videos from <a href="https://nptel.ac.in/courses/108108076">nptel.ac.in/courses/108108076</a> .	<b>TB1:</b> Chapter 14: Alternators and synchronous motors

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			<b>TB2:</b> Chapter 36: AC Synchronous Machine Windings
27.	Construction and working of a three-phase induction motor	<ul style="list-style-type: none"> <li>• Flipped classroom using videos from <a href="https://nptel.ac.in/courses/108108076">nptel.ac.in/courses/108108076</a>.</li> <li>• Demonstration of 3 <math>\Phi</math> Induction motor constructional details in laboratory.</li> </ul>	<b>TB1:</b> Chapter 15: Induction motors <b>TB2:</b> Chapter 38: Induction motor
28.	Significance of torque-slip characteristic. Loss components and efficiency.	Classroom discussion.	<b>TB1:</b> Chapter 15: Induction motors <b>TB2:</b> Chapter 38: Induction motor
29.	Starting and Speed control of induction motor	Flipped classroom using videos from <a href="https://nptel.ac.in/courses/108108076">nptel.ac.in/courses/108108076</a> .	<b>TB1:</b> Chapter 15: Induction motors <b>TB2:</b> Chapter 38: Induction motor
30.	Single-phase induction motor.	<ul style="list-style-type: none"> <li>• Classroom discussion</li> <li>• Laboratory experiment on slip-torque characteristics of 1 <math>\Phi</math> induction motor.</li> </ul>	<b>TB1:</b> Chapter 15: Induction motors <b>TB2:</b> Chapter 38: Induction motor
31.	Construction, working, torque-speed characteristic and speed control of separately excited dc motor	<ul style="list-style-type: none"> <li>• Flipped classroom using videos from <a href="https://nptel.ac.in/courses/108108076">nptel.ac.in/courses/108108076</a>.</li> <li>• Laboratory experiment on speed control of separately excited dc motor.</li> </ul>	<b>TB1:</b> Chapter 16: DC machines. <b>TB2:</b> Chapter 42: Direct current motors
32.	Construction and working of synchronous generators	Flipped classroom using videos from <a href="https://nptel.ac.in/courses/108108076">nptel.ac.in/courses/108108076</a> .	<b>TB1:</b> Chapter 14: Alternators and synchronous motors <b>TB2:</b> Chapter 37: Characteristics of AC synchronous machines

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Unit 5	Power Converters	--	--
33.	DC-DC buck and boost converters	<ul style="list-style-type: none"> <li>Classroom discussion</li> <li>Flipped classroom using videos from <a href="http://nptel.ac.in/courses/108101038/">http://nptel.ac.in/courses/108101038/</a></li> </ul>	<b>TB2:</b> Chapter 45: Power Electronics <b>TB3:</b> Chapter 5: DC-DC converter
34.	Duty ratio control	<ul style="list-style-type: none"> <li>Classroom discussion and Numerical solving.</li> <li>Laboratory experiment on duty cycle control principal.</li> </ul>	<b>TB2:</b> Chapter 45: Power Electronics <b>TB3:</b> Chapter 6: Pulse width modulated inverters
35.	Single-phase inverters	<ul style="list-style-type: none"> <li>Classroom discussion</li> <li>Laboratory experiment on single phase inverter.</li> </ul>	<b>TB2:</b> Chapter 45: Power Electronics
36.	Three-phase voltage source inverters, sinusoidal modulation	Classroom discussion	<b>TB2:</b> Chapter 45: Power Electronics <b>TB3:</b> Chapter 5: DC-DC converter Chapter 6: Pulse width modulated inverters
37.	Sinusoidal modulation	Classroom discussion	<b>TB2:</b> Chapter 45: Power Electronics <b>TB3:</b> Chapter 5: DC-DC converter Chapter 6: Pulse width modulated inverters
Unit 6	Electrical Installations	--	--
38.	Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB	Classroom discussion	<b>TB1:</b> Chapter 19: Electrical installation and illumination
39.	Types of Wires and Cables, Earthing, Types of Batteries	Classroom discussion and peer instructions.	<b>TB1:</b> Chapter 19: Electrical installation and illumination

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40.	Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup	Classroom discussion and numerical solving.	<b>TB1:</b> Chapter 19: Electrical installation and illumination
41.	Single-phase voltage source inverters	Classroom discussion	<b>TB1:</b> Chapter 19: Electrical installation and illumination
42.	Three-phase voltage source inverters	Classroom discussion	<b>TB1:</b> Chapter 19: Electrical installation and illumination
43, 44, 45	Beyond classroom activities; including remedial lectures, guest lectures and other extension activities.		

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(Prepared by Concerned Faculty/HOD)



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<b>Program: MBA. Tech. (I.T., EXTC, Mechanical, Computer, Chemical)</b>					<b>Semester: II</b>	
<b>Course/Module: Physics</b>					<b>Module Code: MBIT02010, MBET02010, MBME02010, MBCO02010, MBCH02010</b>	
<b>Teaching Scheme</b>					<b>Evaluation Scheme</b>	
<b>Classroom Session</b>	<b>Lecture (Hours per week)</b>	<b>Tutorial (Hours per week)</b>	<b>Practical/ Group work (Hours per week)</b>	<b>Credit</b>	<b>Internal Continuous Assessment (ICA) (Marks - 50)</b>	<b>Term End Examinations (TEE) (Marks - 100 in Question Paper)</b>
45	3	1	2	5	Marks Scaled to 50	Marks Scaled to 50
<b>Course Rationale:</b> This course aims to introduce students with the different concepts of optics and its applications. Also, it aims to develop in students, an insight into applying the different laws of electromagnetism and quantum mechanics in everyday life.						
<b>Course Objectives:</b> 1. To enable students to understand the basic principles of optics, electricity and magnetism, quantum physics and their applications. 2. To enhance the student's ability to apply the principles of Physics in solving engineering problems in everyday life.						
<b>Course Outcomes:</b> After completion of the course, students would be able to: 1. Understand the principles of optics viz., diffraction polarization and apply same to different technologies like LASER and fiber optics 2. Interpret the laws of electromagnetism and various terms related to electromagnetic properties of matter such as, permeability, polarization, etc. 3. Explain the basic laws related to quantum mechanics and apply them to solve simple quantum mechanical problems.						
<b>Pedagogy:</b> Work-based learning, Context-based learning, Adaptive Teaching						
<b>Textbooks:</b> TB1. <i>Optics</i> , 6 e, Ajoy Ghatak, McGraw-Hill Education (India) Pvt. Ltd., 2017. TB2. <i>Introduction to electrodynamics</i> , 4 e, D. J. Griffiths, Pearson Education Limited, 2015. TB3. <i>Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles</i> , 2 e, R. Eisberg and R. Resnick, John Wiley & Sons, Indian Reprint, 2013.						
<b>Reference Books:</b> RB1. <i>Concept of Modern Physics</i> , 7 e (SIE), A. Beiser, S. Mahajan and S. Choudhury, Tata McGraw Hill, 2015. RB2. <i>Lectures on Physics Vol – I, Mainly Mechanics, Radiation, and Heat</i> , 1 e, R. Feynman, Pearson Education, 2016.						

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RB3. *Lectures on Physics Vol – II, Mainly Electromagnetism and Matter*, 1 e, R. Feynman, Pearson Education, 2016.

RB4. *Lectures on Physics Vol – III, Quantum Mechanics*, 1 e, R. Feynman, Pearson Education, 2016.

**Links to websites:**

- <http://nptel.ac.in/courses/115104096/>

**Evaluation Scheme:**

• Tutorial Test/Presentation/viva/quiz	30%
• Mid Term	20%
• Term End Exam	50%
<b>Total</b>	<b>100%</b>

**Session Plan:**

Session	Topics	Pedagogical Tool	Textbook Chapters & Readings
<b>Unit 1:</b>	<b>Optics and Fiber Optics</b>	--	--
1.	Introduction to interference and examples	<ul style="list-style-type: none"> <li>• Class room lectures,</li> <li>• Learning by performing experiment</li> </ul>	<b>TB1:</b> Chapter 14: Two Beam Interference by Division of wavefront Chapter 15: Interference by Division of Amplitude
2.	Diffraction: Concept of diffraction, Fraunhofer and Fresnel diffraction, Fraunhofer diffraction at single slit, double slit, and multiple slits	<ul style="list-style-type: none"> <li>• Class room lectures,</li> <li>• Problem solving</li> <li>• Learning by performing experiment</li> </ul>	<b>TB1:</b> Chapter 18: Fraunhofer Diffraction I Chapter 20: Fresnel Diffraction
3.	Characteristics of diffraction grating and its applications.	<ul style="list-style-type: none"> <li>• Class room lectures,</li> <li>• Problem solving</li> <li>• Learning by performing experiment</li> </ul>	
4.	Polarization: Introduction, polarization by reflection, polarization by double refraction.	<ul style="list-style-type: none"> <li>• Class room lectures,</li> <li>• Learning by performing experiment</li> </ul>	<b>TB1:</b> Chapter 22: Polarization and Double Refraction
5.	Scattering of light, circular and elliptical	<ul style="list-style-type: none"> <li>• Class room lectures,</li> </ul>	

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	polarization, optical activity.	<ul style="list-style-type: none"> <li>• Problem solving</li> <li>• Learning by performing experiment</li> </ul>	
6.	Fiber Optics: Introduction, optical fiber as a dielectric wave guide, total internal reflection	<ul style="list-style-type: none"> <li>• Class room lectures,</li> <li>• Learning by performing experiment</li> </ul>	<b>TB1:</b> Chapter 28: Optical Fiber Basics using Ray Optics
7.	Numerical aperture and various fiber parameters, losses associated with optical fibers	<ul style="list-style-type: none"> <li>• Class room lectures,</li> <li>• Problem solving</li> <li>• Learning by performing experiment</li> </ul>	
8.	Step and graded index fibers, Application of optical fibers.	<ul style="list-style-type: none"> <li>• Class room lectures</li> </ul>	
9.	Lasers: Introduction to interaction of non-ionizing radiation with matter	<ul style="list-style-type: none"> <li>• Class room lectures</li> </ul>	<b>TB1:</b> Chapter 27: LASERs: An Introduction
10.	Principles and working of laser: Population inversion, pumping, various modes, threshold, population inversion	<ul style="list-style-type: none"> <li>• Class room lectures</li> </ul>	
11.	Solid state LASER, Semiconductor LASER, Gas LASER.	<ul style="list-style-type: none"> <li>• Class room lectures</li> </ul>	
12.	Application of lasers	<ul style="list-style-type: none"> <li>• Class room lectures</li> </ul>	
<b>Unit 2:</b>	<b>Electromagnetism and Magnetic Properties of Materials</b>	--	--
13.	Laws of electrostatics	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Learning by performing experiment</li> </ul>	<b>TB2:</b> Chapter 2: Electrostatics
14.	Electric current and the continuity equation		<b>TB2:</b> Chapter 4: Electric fields in Matter
15.	laws of magnetism, Ampere's Faraday's laws		<b>TB2:</b> Chapter 5: Magnetostatics
16.	Maxwell's equations		<b>TB2:</b> Chapter 7: Electrodynamics
17.	Polarization, Permeability and dielectric constant	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> </ul>	<b>TB2:</b> Chapter 4: Electric fields in

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18.	Polar and non-polar dielectrics	<ul style="list-style-type: none"> <li>• Learning by performing experiment</li> <li>• Literature survey</li> </ul>	Matter
19.	Internal fields in a solid		
20.	Clausius-Mossotti equation		
21.	Applications of dielectrics		
22.	Magnetisation	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Learning by performing experiment</li> <li>• Literature survey</li> </ul>	<b>TB2:</b> Chapter 6: Magnetic fields in Matter
23.	Permeability and susceptibility		
24.	Classification of magnetic materials		
25.	Ferromagnetism, magnetic domains and hysteresis		
26.	Applications of magnetism		
<b>Unit 3:</b>	<b>Quantum Mechanics</b>	--	--
27.	Introduction to Quantum Physics	<ul style="list-style-type: none"> <li>• Class room lectures,</li> <li>• Learning by performing experiment</li> <li>• By showing animated videos</li> </ul>	<b>TB3:</b> Chapter 1: Thermal Radiation and Planck's Postulate Chapter 2: Photons-Particle like Properties of Radiation
28.	Black body radiation		<b>TB3:</b> Chapter 1: Thermal Radiation and Planck's Postulate Chapter 2: Photons-Particle like Properties of Radiation
29.	Explanation using the photon concept		<b>TB3:</b> Chapter 1: Thermal Radiation and Planck's Postulate Chapter 2: Photons-Particle like Properties of Radiation
30.	Photoelectric effect		<b>TB3:</b> Chapter 1: Thermal Radiation and Planck's Postulate Chapter 2: Photons-Particle like Properties of Radiation
31.	Compton effect		<b>TB3:</b> Chapter 1: Thermal Radiation and Planck's Postulate Chapter 2: Photons-Particle like

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			Properties of Radiation
32.	de Broglie hypothesis	<ul style="list-style-type: none"> <li>Class room lectures,</li> <li>Problem solving</li> <li>Learning by performing experiment</li> </ul>	<b>TB3:</b> Chapter 3: De Broglie's Postulate-Wavelike Properties of Particles
33.	Wave-particle duality		<b>TB3:</b> Chapter 3: De Broglie's Postulate-Wavelike Properties of Particles
34.	Born's interpretation of the wave function		<b>TB3:</b> Chapter 3: De Broglie's Postulate-Wavelike Properties of Particles
35.	Verification of matter Waves		<b>TB3:</b> Chapter 3: De Broglie's Postulate-Wavelike Properties of Particles
36.	Uncertainty principle		<b>TB3:</b> Chapter 3: De Broglie's Postulate-Wavelike Properties of Particles
37.	Schrodinger wave Equation (Time Independent form)	<ul style="list-style-type: none"> <li>Class room lectures,</li> <li>Problem solving</li> <li>By showing animated videos</li> </ul>	<b>TB3:</b> Chapter 5: Schrödinger's Theory of Quantum Mechanics
38.	Schrodinger wave Equation (Time dependent form)	<ul style="list-style-type: none"> <li>Class room lectures,</li> <li>Problem solving</li> <li>By showing animated videos</li> </ul>	<b>TB3:</b> Chapter 5: Schrödinger's Theory of Quantum Mechanics
39.	Solution of Schrodinger wave equation	<ul style="list-style-type: none"> <li>Class room lectures,</li> <li>Problem solving</li> <li>By showing animated videos</li> </ul>	<b>TB3:</b> Chapter 6: Solutions of Time-Independent Schrödinger Equations
40.	Particle in box	<ul style="list-style-type: none"> <li>Class room lectures,</li> <li>Problem solving</li> <li>By showing animated videos</li> </ul>	<b>TB3:</b> Chapter 6: Solutions of Time-Independent Schrödinger Equations
41.	Quantum harmonic oscillator	<ul style="list-style-type: none"> <li>Class room lectures,</li> <li>Problem solving</li> <li>By showing animated videos</li> </ul>	<b>TB3:</b> Chapter 6: Solutions of Time-Independent Schrödinger Equations

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42.	Hydrogen atom.	<ul style="list-style-type: none"><li>• Class room lectures,</li><li>• Problem solving</li><li>• By showing animated videos</li></ul>	<b>TB3:</b> Chapter 6: Solutions of Time-Independent Schrödinger Equations
43, 44, 45	Beyond classroom activities; including remedial lectures, guest lectures and other extension activities.		

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<b>Program: MBA. Tech. (I.T., EXTC, Mechanical, Computer, Chemical)</b>					<b>Semester: II</b>	
<b>Course/Module: Engineering Graphics &amp; Design</b>					<b>Module Code: MBIT02011, MBET02011, MBME02011, MBCO02011, MBCH02011</b>	
<b>Teaching Scheme</b>					<b>Evaluation Scheme</b>	
<b>Classroom Session</b>	<b>Lecture (Hours Per week)</b>	<b>Tutorial (Hours per week)</b>	<b>Practical/ Group work (Hours per week)</b>	<b>Credit</b>	<b>Internal Continuous Assessment (ICA) (Marks - 50)</b>	<b>Term End Examinations (TEE) (Marks - 100 in Question Paper)</b>
<b>30</b>	<b>2</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>Marks Scaled to 50</b>	<b>Marks Scaled to 50</b>
<b>Course Rationale:</b> This course is aimed at providing basic understanding of the fundamentals of Engineering Graphics; mainly visualization, graphics theory, standards & conventions of drawing, the tools of drawing and the use of drawings in engineering applications. The topics covered are tailored to suit the requirements of undergraduate studies in engineering. The course has been structured to include sufficient simulations which would aid the student in visualization of three dimensional objects and developing the drawing.						
<b>Course Objectives:</b> <ol style="list-style-type: none"> <li>1. To impart knowledge about engineering design and its place in society.</li> <li>2. To introduce the visual aspects of engineering design.</li> <li>3. To familiarize the aspects of engineering graphics standards.</li> <li>4. To be able to create solid models.</li> <li>5. To apply computer-aided geometric design concepts and creation of working drawings.</li> </ol>						
<b>Course Outcomes:</b> After completion of the course, students would be able to: <ol style="list-style-type: none"> <li>1. Interpret and communicate drawings effectively using different types of curves, lines, planes.</li> <li>2. Analyze the concepts of projection and section of right regular solids with their development.</li> <li>3. Apply the techniques, skills, and modern tools to create projections of machine components with the help of software.</li> </ol>						
<b>Pedagogy:</b> Lectures, Experiential learning activities, quizzes, application-based videos, use of drafting software.						
<b>Textbooks:</b> TB1. <i>Engineering Drawing</i> , 53 e, N. D. Bhatt, V. M. Panchal and P. R. Ingle, Charotar Publishing House, 2014.						
<b>Reference Books:</b> RB1. <i>Engineering Drawing and Computer Graphics</i> , 2 e, M. B. Shah and B. C. Rana, Pearson Education, 2009. RB2. <i>Engineering Drawing</i> , 6 e, K. Venugopal, New Age International (P) Ltd. Publishers, 2011.						
<b>Links to websites:</b> <ul style="list-style-type: none"> <li>• <a href="http://nptel.ac.in/courses/112103019/">http://nptel.ac.in/courses/112103019/</a></li> </ul>						

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<b>Evaluation Scheme:</b>			
•	Drawing Hall Sheets and AutoCAD Prints	30 %	
•	Mid Term	20 %	
•	Term End Exam	50 %	
	<b>Total</b>	<b>100 %</b>	
<b>Session Plan:</b>			
Session	Topics	Pedagogical Tool	Textbook Chapters & Readings
<b>Unit 1:</b>	<b>Introduction to Engineering Drawing</b>	--	--
1.	Principles of Engineering Graphics and their significance.	<ul style="list-style-type: none"> <li>Lectures</li> <li>Application-based videos</li> </ul>	<b>TB1:</b> Chapter 1: Drawing instruments and Their Uses
2.	Usage of Drawing instruments, lettering, numbering.	<ul style="list-style-type: none"> <li>Lectures</li> <li>Application-based videos</li> </ul>	<b>TB1:</b> Chapter 1: Drawing instruments and Their Uses
3.	Conic sections including the Rectangular Hyperbola (General method only)	<ul style="list-style-type: none"> <li>Lectures</li> <li>Problem Solving</li> </ul>	<b>TB1:</b> Chapter 6: Curves used in Engineering
4.	Cycloid, Epi-cycloid, Hypo-cycloid and Involutives; Scales – Plain, Diagonal and Vernier Scales	<ul style="list-style-type: none"> <li>Lectures</li> <li>Problem Solving</li> </ul>	<b>TB1:</b> Chapter 6: Curves used in Engineering
<b>Unit 2:</b>	<b>Projections of Lines and Planes</b>	--	--
5.	Introduction to Projections of Points; Conventions; Points locating in all Quadrants	<ul style="list-style-type: none"> <li>Lectures</li> <li>Application-based videos</li> </ul>	<b>TB1:</b> Chapter 10: Projections of Lines
6.	Projections of Lines; inclined to One plane, Parallel to planes	<ul style="list-style-type: none"> <li>Lectures</li> <li>Application-based videos</li> </ul>	<b>TB1:</b> Chapter 10: Projections of Lines
7.	Projections of lines inclined to both planes	<ul style="list-style-type: none"> <li>Lectures</li> <li>Application-based videos</li> </ul>	<b>TB1:</b> Chapter 10: Projections of Lines
8.	Practice session on Projections of lines including elevation length (EL) and plan length (PL)	<ul style="list-style-type: none"> <li>Lectures</li> <li>Application-based videos</li> </ul>	<b>TB1:</b> Chapter 10: Projections of Lines
9.	Projections of Planes: Introduction, types of planes	<ul style="list-style-type: none"> <li>Lectures</li> <li>Problem Solving</li> </ul>	<b>TB1:</b> Chapter 11: Projection of Planes
10.	Projection of Auxiliary Planes	<ul style="list-style-type: none"> <li>Lectures</li> <li>Problem Solving</li> </ul>	<b>TB1:</b> Chapter 11: Projection of Auxiliary Planes Chapter 12: Projection of Planes

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Unit 3:	Projections of Regular Solids	--	--
11.	Projections of Regular Solids covering those inclined to both the Planes for Prisms Auxiliary Views	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> </ul>	<b>TB1:</b> Chapter 13: Projection of Solids
12.	Projections of Regular Solids covering those inclined to both the Planes for Pyramids Auxiliary Views	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> <li>• Experiential learning activities</li> </ul>	<b>TB1:</b> Chapter 13: Projection of Solids
13.	Projections of Regular Solids covering those inclined to both the Planes for Cones and Cylinders Auxiliary Views	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> <li>• Experiential learning activities</li> </ul>	<b>TB1:</b> Chapter 13: Projection of Solids
14.	Projections of Regular Solids covering those inclined to both the Planes for Cylinders	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> </ul>	<b>TB1:</b> Chapter 13: Projection of Solids
Unit 4:	Section and Development of Regular Solids	--	--
15.	Introduction to Section and Development of Regular Solids	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> <li>• Experiential learning activities</li> </ul>	<b>TB1:</b> Chapter 14: Section of Solids
16.	Section of Regular Prism– Auxiliary Views;	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> <li>• Experiential learning activities</li> </ul>	<b>TB1:</b> Chapter 14: Section of Solids
17.	Section of Regular Cylinder – Auxiliary Views;	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> <li>• Experiential learning activities</li> </ul>	<b>TB1:</b> Chapter 14: Section of Solids
18.	Section of Regular Pyramid – Auxiliary Views;	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-</li> </ul>	<b>TB1:</b> Chapter 14: Section of Solids

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		<ul style="list-style-type: none"> <li>based videos</li> <li>• Experiential learning activities</li> </ul>	
19.	Section of Regular Cone – Auxiliary Views;	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> <li>• Experiential learning activities</li> </ul>	<b>TB1:</b> Chapter 14: Section of Solids
20.	Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> <li>• Experiential learning activities</li> </ul>	<b>TB1:</b> Chapter 14: Section of Solids
21.	Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> <li>• Experiential learning activities</li> </ul>	<b>TB1:</b> Chapter 14: Section of Solids
22.	Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> <li>• Experiential learning activities</li> </ul>	<b>TB1:</b> Chapter 14: Section of Solids
<b>Unit 5:</b>	<b>Orthographic Projections</b>	--	--
23.	<ul style="list-style-type: none"> <li>• Principles of Orthographic projection- Conventions Quadrant formation and Projections of Points</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> </ul>	<b>TB1:</b> Chapter 13: Projection of Solids
24.	<ul style="list-style-type: none"> <li>• Conversion of Orthographic Views to Isometric Views and Vice-versa, Conventions;</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> </ul>	<b>TB1:</b> Chapter 13: Projection of Solids
<b>Unit 6:</b>	<b>Sectional Orthographic Projections</b>		
25.	<ul style="list-style-type: none"> <li>• Principles of Sectional Orthographic projection, need of sectional views</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> <li>• Application-based videos</li> </ul>	<b>TB1:</b> Chapter 8: Orthographic Projection
26.	<ul style="list-style-type: none"> <li>• Sectional Orthographic projection; types of sections; hatching of</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Problem Solving</li> </ul>	<b>TB1:</b> Chapter 8: Orthographic

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	sectioned part and principles	<ul style="list-style-type: none"> <li>Application-based videos</li> </ul>	Projection
27.	Draw the sectional orthographic views of geometrical solids, objects from industry	<ul style="list-style-type: none"> <li>Lectures</li> <li>Problem Solving</li> <li>Application-based videos</li> </ul>	<b>TB1:</b> Chapter 8: Orthographic Projection
28.	Draw the sectional orthographic views of geometrical dwellings (foundation to slab only)	<ul style="list-style-type: none"> <li>Lectures</li> <li>Problem Solving</li> <li>Application-based videos</li> </ul>	<b>TB1:</b> Chapter 8: Orthographic Projection
<b>Unit 7:</b>	<b>Isometric Projections</b>	--	--
29.	<ul style="list-style-type: none"> <li>Principles of Isometric projection- Isometric Scale, Isometric Views, Conventions; Isometric views of lines, Planes, Simple and compound Solids;</li> </ul>	<ul style="list-style-type: none"> <li>Lectures</li> <li>Problem Solving</li> <li>Application-based videos</li> </ul>	<b>TB1:</b> Chapter 17: Isometric Projection
30.	<ul style="list-style-type: none"> <li>Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions;</li> </ul>	<ul style="list-style-type: none"> <li>Lectures</li> <li>Problem Solving</li> <li>Application-based videos</li> </ul>	<b>TB1:</b> Chapter 17: Isometric Projection
<b>*Note:</b> <ul style="list-style-type: none"> <li>Minimum four drawing sheets to be completed in drawing hall covering contents from Unit 1 to unit 4.</li> <li>Minimum Six drawing sheets to be completed in CAD practical session covering contents from Unit 5 to unit 7 by using suitable drafting software (AutoCAD).</li> </ul>			

Signature

(Prepared by Concerned Faculty/HOD)



Signature

(Approved by Dean)

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<b>Program: MBA. Tech. (I.T., EXTC, Mechanical, Computer, Chemical)</b>					<b>Semester: II</b>	
<b>Course/Module: Constitution of India</b>					<b>Module Code: MBIT02012, MBET02012, MBME02012, MBCO02012, MBCH02012</b>	
<b>Teaching Scheme</b>					<b>Evaluation Scheme</b>	
<b>Classroom Session</b>	<b>Lecture (Hours per week)</b>	<b>Tutorial (Hours per week)</b>	<b>Practical/ Group work (Hours per week)</b>	<b>Credit</b>	<b>Internal Continuous Assessment (ICA) (Marks - 50)</b>	<b>Term End Examinations (TEE)</b>
30	2	0	0	0	Marks Scaled to 50	--
<b>Course Rationale:</b> Constitution is the basic law of the land for any nation, and it is expected for its citizens to have knowledge of it. This course aims to ingrain into the student's mind the basic principles of Constitution of India. Students are already exposed to Preamble of the constitution, but the exposure is only superficial. This course aims at providing in depth rationale behind the Preamble. It also aims to provide knowledge with respect to fundamental rights provided in the Constitution and permissible restrictions upon it and the institutions within 'State' and their inter-relation with each other. Topics covered in this course consists of the evolution and nature of the Indian Constitution, Preamble, Fundamental rights and duties, Directive Principles of State Policy, the Union Parliament, Federal structure of Indian polity, Indian Judiciary, Emergency provisions and Amendment powers and its usage since inception of Constitution till date.						
<b>Course Objectives:</b> 1. To enable the students to understand the principles mentioned in our Constitution and apply them in regular course of activities, personal or professional. 2. To enable them to know the structure of Indian polity, legal framework and inter-relations of institutions of 'State' in India						
<b>Course Outcomes:</b> After completion of the course, students would be able to: 1. Understand the historic evolution of the Indian Constitution, its drafting, nature and to understand the principles mentioned in its Preamble. 2. Inculcate fundamental rights in its true sense and also the permissible restrictions upon it so as to enjoy these rights within permissible limits while simultaneously performing their duties and concept of Directive Principles of State policy and to apply these principles into their professional lives. 3. Ingrain the structure of our polity and inter-relation of various organs of State – Legislature (Parliament), Executive (Government) and Judiciary (Courts) and also relation between Union, States and Local Self Governments and amendment of the Constitution by the Parliament. 4. Attain knowledge of the Emergency provisions, when and how it is imposed, to know the additional powers the bestowed upon the Government at times of Emergency and to understand the Amendment procedure.						
<b>Pedagogy:</b> Lectures, presentations and group discussions.						

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<b>Textbooks:</b>			
TB1. <i>Introduction to the Constitution of India</i> , 22 e, Dr. Durga Das Basu, Lexis Nexis, 2016.			
<b>Reference Books:</b>			
RB1. <i>The Constitution of India</i> , 14 e, P. M. Bakshi, Universal Law Publishing, 2017.			
RB2. <i>Constitutional Law of India</i> , 54 e, J. N. Pandey, Central Law Agency, 2017.			
RB3. <i>We the people</i> , N. A. Palkhivala, UBS Publishers Distributors, 1999.			
<b>Evaluation Scheme:</b>			
• Presentation/viva/quiz/Assignment		60%	
• Mid Term		40%	
<b>Total</b>		<b>100%</b>	
<b>Session Plan:</b>			
Session	Topics	Pedagogical Tools	Textbook Chapters & Readings
<b>Unit 1:</b>	<b>Evolution of Indian Constitution:</b>	--	--
1.	Historic development of drafting and framing of Constitution	Lectures	<b>TB1:</b> Chapter 1: The Historical Background Chapter 2: The Making of the Constitution
2.	Meaning of Constitution and Constitutionalism	Lectures	<b>TB1:</b> Chapter 3: The Philosophy of the Constitution
3.	Nature and Characteristics of our Constitution	Lectures	<b>TB1:</b> Chapter 4: Outstanding Features of our Constitution
4.	Preamble, its meaning and principles mentioned therein	Lectures	<b>TB1:</b> Chapter 5: Nature of the Federal System
<b>Unit 2:</b>	<b>Fundamental rights, Fundamental duties and Directive Principles of State Policy</b>	--	--
5.	Concept of 'State' and Status of Laws which are in derogation with Fundamental rights	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Presentations</li> <li>• Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties
6.	Right to Equality under Article 14	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Presentations</li> <li>• Group</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties

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		Discussions	
7.	Related Rights under equality mentioned in Article 15,16,17 and 18	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Presentations</li> <li>• Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties
8.	Right to freedom of Speech and Expression under Art. 19(1)(a)	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Presentations</li> <li>• Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties
9.	Right to other freedoms mentioned in Art. 19	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Presentations</li> <li>• Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties
10.	Rights under Art. 20	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Presentations</li> <li>• Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties
11.	Right to Life	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Presentations</li> <li>• Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties
12.	Other factors governing Right to life	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Presentations</li> <li>• Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties
13.	Rights against exploitation, forced labour and Protection given to children below 14 years of age under Art. 23 and 24 respectively	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Presentations</li> <li>• Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties
14.	Religious Rights given to individuals under Art. 25	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Presentations</li> <li>• Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties
15.	Religious Rights given to institutions under Art. 26 and 27	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Presentations</li> <li>• Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties

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16.	Right to minorities under Art. 29 and 30	<ul style="list-style-type: none"> <li>Lecture</li> <li>Presentations</li> <li>Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties
17.	Right to Constitutional Remedies under Art. 32	<ul style="list-style-type: none"> <li>Lecture</li> <li>Presentations</li> <li>Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties
18.	Fundamental Duties	<ul style="list-style-type: none"> <li>Lecture</li> <li>Presentations</li> <li>Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties
19.	Directive Principles of State Policy	<ul style="list-style-type: none"> <li>Lecture</li> <li>Presentations</li> <li>Group Discussions</li> </ul>	<b>TB1:</b> Chapter 8: Fundamental Rights and Duties
<b>Unit 3:</b>	<b>Union, States and Inter-relation between them</b>	--	--
20.	<ul style="list-style-type: none"> <li>Union Parliament</li> <li>Federal Structure of Indian Polity</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Presentations</li> <li>Group Discussions</li> </ul>	<b>TB1:</b> Chapter 5: Nature of the Federal System Chapter 11: The Union Executive Chapter 12: The Union Legislature
21.	Distribution of powers between Union and States	<ul style="list-style-type: none"> <li>Lecture</li> <li>Presentations</li> </ul>	<b>TB1:</b> Chapter 24: Distribution of Legislative and Executive Powers Chapter 26: Administrative Relations between the Union and the States
22.	Local Self Government in India	<ul style="list-style-type: none"> <li>Lecture</li> </ul>	<b>TB1:</b> Chapter 26: Administrative Relations between the Union and the States
<b>Unit 4:</b>	<b>Indian Judiciary and Lok Adalats</b>	--	--
23.	<ul style="list-style-type: none"> <li>The Supreme Court of India</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> </ul>	<b>TB1:</b>

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	<ul style="list-style-type: none"> <li>• Powers and Jurisdictions of Supreme Court</li> </ul>	<ul style="list-style-type: none"> <li>• Presentations</li> <li>• Group Discussions</li> </ul>	Chapter 21: Organisation of the Judiciary in General Chapter 22: The Supreme Court
24.	High Courts and Lok Adalats	<ul style="list-style-type: none"> <li>• Lecture</li> </ul>	<b>TB1:</b> Chapter 23: The High Court
<b>Unit 5:</b>	<b>Emergency Provisions</b>	--	--
25.	National Emergency under Article 352 and 353, its method of enforcement and its implications	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Presentations</li> <li>• Group Discussions</li> </ul>	<b>TB1:</b> Chapter 28: Emergency Provisions
26.	Failure of Constitutional Machinery in a State and Financial Emergency	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Presentations</li> <li>• Group Discussions</li> </ul>	<b>TB1:</b> Chapter 28: Emergency Provisions
<b>Unit 6:</b>	<b>Amendments</b>	--	--
27.	<ul style="list-style-type: none"> <li>• Amendment procedure in Constitution</li> <li>• Limits on power of Parliament to amend Constitution</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> </ul>	<b>TB1:</b> Chapter 10: Procedure for Amendment
28.	Historical perspective of amendments made so far and theories devolved by judgements of Courts	<ul style="list-style-type: none"> <li>• Lecture</li> </ul>	<b>TB1:</b> Chapter 10: Procedure for Amendment
29, 30	Beyond classroom activities; including remedial lectures, guest lectures and other extension activities.		

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