



SETHU INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Pulloor, Kariapatti, Virudhunagar (Dist.) - Pin: 626 115.

Department of Mechanical Engineering

(Accredited by NBA, New Delhi)

(Approved Research Centre by Anna University, Chennai)

INNOVATIVE TEACHING METHODOLOGY

Year	Subject Code	Subject Name	Unit No	Name of the Topic for each unit	Innovation Methodology employed
II	R21UME403	Manufacturing Technology	Unit 1	Tool Life	Visualization https://nptel.ac.in/courses/112105126
			Unit 2	Lathe, Capstan Lathe	Lab visit
			Unit 3	Shaper, Slotter, Planner	Lab visit
			Unit 4	Milling Machines, CNC Programming	Visualization https://www.youtube.com/watch?v=sKEw48dkB90 https://www.youtube.com/watch?v=Z49zSETDW7A
			Unit 5	Ultrasonic Machining	Visualization https://www.youtube.com/watch?v=XXm4Cf_N9CA&t=624s
II	R21UME303	Engineering Thermodynamics	Unit 1	Basic Concept and First Law	Mind Mapping
			Unit 2	Second Law	Cross Word
			Unit 3	Properties of pure substance and steam power cycle	Animated Video
			Unit 4	Ideal and Real gases and thermodynamic relations	NPTEL Video
			Unit 5	Psychrometry	Mind Mapping

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II	R21UME304	Fluid Mechanics and Machinery	Unit 1	Introduction to Fluid Mechanics	Visualization - NPTEL
			Unit 2	Bernoulli's Equation	Visualization - NPTEL
			Unit 3	Buckingham Pi-theorem	Visualization - NPTEL
			Unit 4	Hydraulic Turbines	Visualization - NPTEL
			Unit 5	Hydraulic Pumps	Visualization - NPTEL
II	R21UME305	Basics of Engineering Mechanics	Unit 1	Basics of mechanics	Lab Visit
			Unit 2	Equilibrium of rigid bodies in two dimensions	Visualization - NPTEL
			Unit 3	Practical application of centroid	Visualization - NPTEL
			Unit 4	Applications of friction in real life	Visualization - NPTEL
			Unit 5	Innovative Design of ABS system	Visualization - NPTEL
II	R21UME306	Measurements and Instrumentation	Unit 1	Generalized Measuring System	Visualization - NPTEL https://www.youtube.com/watch?v=YlG9v3vuYMw
			Unit 2	Temperature measurements and Bi-metallic	Visualization - NPTEL https://www.youtube.com/watch?v=As5kzxkyT24 https://www.youtube.com/watch?v=jXZFm98yYvo
			Unit 3	Displacement sensors	Visualization - NPTEL https://www.youtube.com/watch?v=In0l3pOrGsE
			Unit 4	Tool makers microscope	Lab Visit
			Unit 5	Coordinate measuring machine	Lab Visit

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III	21UME501	Heat and Mass Transfer	Unit 1	One Dimensional Steady State Heat Conduction.	Visualization Techniques- NPTEL Video https://www.youtube.com/watch?v=o7Mq4Rdyd1k
			Unit 2	Introduction to boiling and condensation	Think – Pair – Share
			Unit 3	Basic Concepts and Laws of Radiation	Visualization Techniques- NPTEL Video https://nptel.ac.in/courses/112103276/
			Unit 4	Heat Exchanger Classification	Visualization Techniques - NPTEL Video https://www.youtube.com/watch?v=3t-Pk9aiUtE
			Unit 5	Convective Mass Transfer	Visualization Techniques - NPTEL video https://www.youtube.com/watch?v=a9CACg_jiCo
III	21UME502	Dynamics of Machinery	Unit 1	Force Analysis	Models & Mind Mapping
			Unit 2	Balancing of Masses	Visualization & YouTube Video
			Unit 3	Free Vibration	Animation Videos & Lab Visit
			Unit 4	Forced Vibration	Animation Videos & YouTube Video
			Unit 5	Control Mechanism	Models & NPTEL Video
III	21UME602	Operations Research for Mechanical Engineers	Unit 1	LPP Formulation	Role Play
			Unit 2	Transportation model	TORA Software
			Unit 3	Construction of Network	NPTEL Video
			Unit 4	Individual Replacement	Excel Calculation
			Unit 5	Dominance Property	NPTEL Video

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III	21UME504	Design of Machine Elements	Unit 1	Theories of Failure and Stress Concentration	NPTEL Video
			Unit 2	Design of Knuckle Joint, Coupling	Demonstration Using Model
			Unit 3	Design of bolt and rivets for eccentric loads	NPTEL Video
			Unit 4	Design of Helical Spring and Flywheel	Lab Visit and Model Demonstration
			Unit 5	Rolling Contact bearings and Crank shaft	Demonstration Using Model
III	21MEV308	Industry 4.0	Unit 1	The Various Industrial Revolutions, Industry 4.0 Factory	Visualization https://www.youtube.com/watch?v=LEnLra7y7M4 https://www.youtube.com/watch?v=y8bJk_hGYD4
			Unit 2	Lean tools	Visualization https://www.youtube.com/watch?v=Bk0BbznfpBg
			Unit 3	IIOT	IoT Kit Demo, Visualization https://www.youtube.com/watch?v=GlibeXqKa4Q
			Unit 4	Additive Manufacturing (AM) systems	3D Printer Live Demo, Visualization https://www.youtube.com/watch?v=f94CnlQ0eq4
			Unit 5	Industrial Robotic Applications	Visualization https://www.youtube.com/watch?v=nmuGIM3fC84 NPTEL https://www.youtube.com/watch?v=L3APegLIE8A

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III	21MEV208	Production Planning and Control	Unit 1	Break even analysis.	Visualization https://www.youtube.com/watch?v=Eyp966Ty4xg
			Unit 2	Work Measurement Techniques (Time Study & Motion Study)	industry Case Study https://youtu.be/8xFt6BIQTHA?si=eaBqa3D-em0Ncw7t
			Unit 3	Computer Aided Process Planning (CAPP)	Case Study: Siemens – AI-Based Generative CAPP for Smart Factories. https://youtu.be/0GpZ4sE20-c?si=FZEaDYaoBR3WuC4p
			Unit 4	Material Requirement Planning	visualization https://youtu.be/u3P6YMI5Ah0?si=6pZLvW9HeVOYZjnI
			Unit 5	ABC Analysis	NPTEL Lecture Video https://youtu.be/fzY_wPtPkbM?si=P3ZOgzc0EFhE5Rp
IV	21UME701	Project Management and Finance	Unit 1	Project Organizational Structure	NPTEL Video https://youtu.be/DeOslgShzml?si=6UPEAvAJbJXO-r1g
			Unit 2	Developing project network using PERT/CPM	NPTEL Video https://youtu.be/fDh0K3SYT6A?si=BiuFb1tuUzPVFYbI
			Unit 3	Resources and critical chain scheduling	NPTEL Video https://youtu.be/g4Wb9Ftjncc?si=dXcB6gyV_ITJ7M5z
			Unit 4	Tools and techniques used in quality management	Mind Mapping
			Unit 5	Construction and evaluation of balance sheet	NPTEL Video https://www.youtube.com/watch?v=iTaQeiRjX-4

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IV	21UME702	Mechatronics and IOT	Unit 1	Sensors and Transducers - Performance Terminology	Visualization - NPTEL https://youtu.be/xHPZ0jK6-u8
			Unit 2	Pneumatic and Hydraulic Systems	Animated Video
			Unit 3	Arduino board – Arduino Uno – digital I/O pins - power pins – accessories – breadboard	Real World Example
			Unit 4	Programmable Logic Controllers – Basic Structure	Mind Mapping
			Unit 5	Mechatronic System	Case Study
IV	21MEV202	Additive Manufacturing	Unit 1	Business Opportunities and Future Directions	Flipped Classroom
			Unit 2	Part Orientation-Support Structure-Slicing	NPTEL Video
			Unit 3	Laser Engineered Net Shaping (LENS)	NPTEL Video
			Unit 4	Fused Deposition Modeling (FDM)-Advantages & Disadvantages	NPTEL Video
			Unit 5	Three-Dimensional Printing-Materials-Process-Benefits-Limitations-Applications.	Equipment Lab Visit
IV	21MEV1007	Statistical Quality Control	Unit 1	Total Quality Management	Visualization - Video Lecture
			Unit 2	Statistical Process Control	Visualization - Video Lecture
			Unit 3	Statistical Basis of the X bar and R bar Charts	NPTEL Video Lecture
			Unit 4	Control Chart for Fraction Nonconforming (p-chart)	NPTEL Video Lecture
			Unit 5	Single sampling plan for attributes	NPTEL Video Lecture

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IV	21MEV403	Industrial Robotics	Unit 1	Degrees of Freedom	Visualization
			Unit 2	Sensors	Visualization / Model
			Unit 3	Pneumatic Drives	Lab Visit
			Unit 4	Mobile Robot	Model
			Unit 5	Agricultural Robots	Visualization
IV	21MEV707	Machine Learning for Intelligent Systems	Unit 1	Supervised, Unsupervised M/L	NPTEL Video
			Unit 2	Linear Regression	Online Source https://www.socscistatistics.com
			Unit 3	Naive Bayes, KNN Algorithm	Microsoft Excel
			Unit 4	Bagged Decision Trees	Microsoft Excel
			Unit 5	Convolutional Neural Network	NPTEL Video

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IV	21MEV101	Automobile Engineering	Unit 1	Vehicle aerodynamic resistance	NPTEL Videos
			Unit 2	Transmission and auxiliary systems- Differential, and Rear axle	Animated Video
			Unit 3	Steering, brakes and suspension system Hydraulic Braking Systems- Introduction	Animated Video
			Unit 4	Alternate fuels and emission control- Emission norms and emission control techniques	NPTEL Video
			Unit 5	Smart vehicles- Artificial Intelligence – machine learning-deep learning	NPTEL Video
IV	21MEV805	Power Plant Engineering	Unit 1	Steam power plant	Animated Video
			Unit 2	Components of steam power plant	NPTEL Video
			Unit 3	Nuclear power plant	Animated video
			Unit 4	Gas turbine power plant	Animated video
			Unit 5	Wind power plant	Animated video