DEPARTMENT OF MECHANICAL ENGINEERING

DETAILS OF GAP/CONTENT BEYOND SYLLABUS

List of additional topics covered to bridge the curriculum gaps in the last three years are as follows:

Sl. No	Course Name	Identified Gaps	Course of Action
1	Mechanical Measurements and Metrology (18ME36B)	Measurement of acceleration by Accelerometers	Class Room Teaching: Delivery with black board and Multimedia presentations
2	Mechanics of Materials (18ME32)	Flow over a cylinder problem using Ansys software tool	Demonstrated the Ansys software and solved the problem on flow over cylinder and various contours like pressure, velocity are plotted and analyzed.
3	Applied Thermodynamics (18ME42)	Biodiesel usage in engine	Demonstrated the working of variable compression engine with bio-diesel and various performance parameters values such as heat release rate, brake power, fuel consumption, etc are shown in the computer software.
4	Fluid Mechanics (18ME43)	Impact of jet and its applications	Presentation given on impact of jets on different blades like flat, inclined and curved ones. Also explained the series of vanes applications in turbines for power generation.
5	Materials Science (18ME34)	Processing and applications of Nano materials	Demonstrated the processing and applications of nano materials with multi-media.

6	Materials Science (18ME34)	Choose appropriate metals, alloys, composites, ceramics, polymers and smart materials for various applications.	Students are made into groups and asked them to select particular material for the given application and prepare a report and submit.
7	Materials Science (18ME34)	Strengthening mechanisms in metal matrix composites	Strengthening mechanisms such as Hall Petch, Orowan, Load bearing, Age hardening etc are explained with empiricals. In addition, the use of these mechanisms and their application with relevant to nano and micro particles are also explained.
8	Metal Casting and Welding (18ME35B)	Make use of sustainability in casting process to produce sound castings.	Lecture given on development of tools to promote sustainability in casting process and case study on green foundry process presented.
9	Design of Machine Elements I (18ME52)	Surface failures in different machine elements.	Students are addressed about the surface failures of machine parts by giving real world examples, like machine body failures, gears, automobile parts cutting tools etc
10	Dynamics of Machines (18ME53)	Make use of Robo Analyzer/ Ansys software tools to solve the problems on static and dynamic forces for different mechanisms.	Students will able to simulate and plot the position of the end-effect or from specified values for the joint parameters.
11	Design of Machine Elements I (18ME52)	Industrial Design and introduction to geometrical dimensioning and tolerancing	Technical Talk given on Industrial design & geometrical dimensioning and tolerancing by external speaker. Then the students are evaluated on the basis of quiz.
12	Operations Management (18ME56)	Collection, Organization and Presentation of data and taking a decision (in group of 4-5 students)	Students are made choose the topic related to the course and asked them to collect, organize and present in the class.
13	TurboMachines (18ME54)	Practical demonstration of the turbo-machines with the demonstrating models	Demonstrated different turbomachine models like Pelton wheel, Reciprocating pump, Francis, Kaplan turbine and Centrifugal pumps and explained the inlet and outlet angles with velocity triangles.

14	Operations Management (18ME56)	Managerial analysis & presentation skills	Lecture given on presentation skills and managerial analysis.
15	Management and Economics (18ME51)	Effect of inflation on projects	The students are addressed for inflation on economy by giving extra lecture about different types of inflations like, demand-pull inflation, Cost-push inflation, and Built-in inflation. Few case studies taken and explained to the students.
16	Dynamics of Machines (18ME53)	Analyze the various static and dynamic forces for different mechanisms using appropriate software.	Demonstrated the static and dynamic force analysis for 4 bar mechanism and slider crank mechanism using robo analyzer.
17	Management & Economics (18ME51)	Inflation on economy	The students are addressed for inflation on economy by giving extra lecture about different types of inflations like, demand-pull inflation, Cost-push inflation, and Built-in inflation. Few case studies taken and explained to the students.
18	Turbo Machines (17ME53)	Analyasis of Turbomachines by considering Research based knowledge and data interpretation	Students are made into different groups and asked them to submit the abstract on what they have understood from the paper and submit the report.
19	Turbo Machines (17ME53)	Design and modeling of Pelton wheel bucket	Explained to students about designing and modeling of Pelton wheel by referring the research paper in detail.
20	Non-Traditional Machining (17ME554)	Environmental aspects in the Non-Traditional Machining Process	Presented the environmental aspects in machining by Non-Traditional Machining
21	Automation and Robotics (17ME563)	Robot Installations - Percentage growth sector-wise - Impact on Indian Sectors	Presented the impact of robots on Indian industry sectors
22	Fluid Mechanics Lab (17MEL57)	An overview of Kaplan Turbine: Working principle, merits, demerits and applications.	Demonstrated the working principle with Kaplan Model

23	Energy and Environment (15ME562)	Advanced waste management technology	Lecture given on various advanced waste management techniques
24	Fluid Mechanics Lab (17MEL57)	An overview of Kaplan Turbine: Working principle, merits, demerits and applications.	Demonstrated the working principle with Kaplan Model
25	Automobile Engineering (18ME65)	Hydrogen Fuel Cell Vehicles	Class Room Teaching: Delivery with black board and Multimedia presentations
26	Design of Machine Elements-II (18ME62)	Modeling and Analysis of 2-Stage Reduction Gear Box using appropriate software	Demonstrated the modeling and analysis of two-stage reduction gear box using appropriate software.
27	Design for Manufacturing (18ME731)	Cost estimation in Product Design and Manufacture.	Delivery of the content beyond syllabus was done using online resources / tool i.e., www.custompartnet.com for manufacturing cost estimation. These online tools allow users to perform quick calculations that facilitate the long product design and costing process. Students were instructed to prepare a report on Cost estimation for any standard part.
28	Smart Materials& MEMS (17ME745)	Applications of smart materials & MEMS	The students choose a topic from a module in the curriculum and a report of the applications of smart materials & MEMS is to be presented in group and is evaluated as continuous internal evaluation.
29	Project Management (18ME745)	Case studies in Project Management	The gap is addressed by allotting students a topic from the curriculum and a report of the case study is to be submitted for evaluation.
30	Operations Management (18ME745)	Use of software tools in Operations Management	All the students in section work in teams to prepare a report of the problems solved manually & by using software, for evaluation.
31	Control Engineering (18ME71)	Solve and plot frequency response of transfer functions through appropriate software	Demonstration of open source software Scilab to students to plot Bode and Niquest plots.

32	Fluid Power Systems (17ME72) and Fluid Power Engineering (18ME55)	Building and simulating of fluid power circuits using FluidSIM software	Fluid SIM open source software demonstrated for simulating various power circuits to the students and made to work on it.
33	Fluid Power Systems (17ME72)	Application of Industry 4.0	Industrial application of industry 4.0 in fluid power systems is shown by taking students to the industry visit.
34	Energy Engineering (18ME81)	Sustainable Development and Environmental aspects of power generation	Sustainable development and environmental awareness given to students in the area of power generation through presentation.
35	Dynamics of Machinery (17ME52)	Make use of knowledge gained in the dynamic system to analyze the various static and dynamic forces for different mechanisms using appropriate software.	Demonstrated the static and dynamic force analysis for 4 bar mechanism and slider crank mechanism using robo analyzer.
2022 (Odd sem)			
1	Computer Aided Design and Manufacturing (18ME72)	Variable Assembly Language of Industrial Robots	Demonstrated the use of Variable Assembly Language of Industrial Robots
2	Total Quality Management (18ME734)	Compare and evaluate few case studies of TQM tools and techniques used in industries.	Few case studies of TQM tools and techniques used in industries are elaborated.
3	Operations Research (18ME735)	Solving Operations Research problems using Python language.	Problems solved using Python language
4	Energy Environment (18ME751)	Muncipal solid waste management in metropolitan cities	Best practices about Muncipal solid waste management discussed.
5	Additive Manufacturing (18ME741)	3D print technology based on Fused Deposition Modeling process	Demonstration of 3D print technology based on Fused Deposition Modeling process for simple parts.

6	Automation and Robotics (18ME732)	Design, simulation and analysis of a six-axis robot using robot visualization software.	Design, simulation and analysis of a six-axis robot using robot visualization software is demonstrated.
7	Control Engineering (18ME71)	Simulation of systems for better understanding	Appropriate softwares used to simulate systems.
8	Dynamics of Machines (18ME53)	Difficult to visualize the resultant motions and speed without graphical aid.	ADAMS, a 3D model software is planned to use and demonstrate to visualize the motions and speed.
9	Operations Management (18ME56)	No use of software to solve the problems to get quick solutions	Advised to take MOOC's course on basics in Python for solving problems.
10	Turbo Machines (18ME54)	Performance evaluation of power absorbing turbo machines (Blower)	Physical performance evaluation of blower and discussion using ICT tools.
11	Management & Economics (18ME51)	Inflation in India and Global	Solving problems on inflation in India and global.
12	Fluid Power Engineering (18ME55)	Hydraulic circuit designing using commercial tools.	Demonstration of PLC automation control unit, pneumatic cylinder away from the sensor and circuit designing.
13	Material Science and Engineering (21ME33)	Material characterization techniques	X-ray diffraction (XRD) and scanning electron microscope (SEM) demonstration.
14	Metal casting, forming and Joining processes (21ME32)	Sustainable Manufacturing	Demonstration through ppt and videos
15	Computer Aided Machine Drawing and GD&T (21MEL35)	Analyzing and understanding of the internal parts of the machines	Demonstration of disassembly and assembly of Tail stock parts of lathe machine.

16	Transform calculus, Fourier series and Numerical Techniques (21MAT31)	Brachistochrone Problem	Problems solved using Brachistochrone