National Engineering College, K.R.Nagar, Kovilpatti – 628 503

(An Autonomous Institution - Affiliated to Anna University, Chennai)

Department of Mechanical Engineering

MINUTES OF THE MEETING

The 23rd Board of Studies meeting of the Mechanical Engineering was held on 6th June, 2025 at 10.30 a.m.in in the Conference Hall, Autonomous Block, National Engineering College, K.R.Nagar, Kovilpatti – 628 503

1. The following members were present

1.	**Dr. S. Iyahraja,** Professor & Head, Department of Mechanical Engg., NEC	Chairman
2.	**Dr. D Samuel Raj,** Associate Professor/Mechanical Engineering, CEG Campus, Anna University, Chennai – 600025.	University Nominee
3.	**Dr. M. Venkata Ramanan,** Professor & Director, Institute for Energy Studies, CEG, Anna University, Chennai – 600025	Academic Experts
4.	**Dr. C. Prathap,** Professor / Aerospace Engg, Indian Institute of Space Science & Tech., Thiruvananthapuram.	
5.	**Dr. N. Siva Shanmugam,** Professor / Mechanical Engg., NIT Trichy.	
6.	**Dr. K. Hariharan,** Associate Professor / Mechanical Engineering, IIT Madras.	
7.	**Mr. K. Monickavasagom Pillai**, Chief Scientist, CSIR –National Aerospace Laboratories, Bangalore.	Meritorious Alumnus Nominated by the Principal
8.	**Mr. V. Hari Babu** Senior Vice President, Head of Engineering (Aero) & DOA Delegations Responsible, Axiscades Technologies Ltd., Bangalore.	Industrial Experts
9.	**Mr. S. Ravikumar** Chief Research & Innovation Testing and Validation, Iniciotek Private Limited, Chennai.	

10.	**Mr. A T Paary,** Deputy General Manager, Mechanical – Static Dept., Larsen & Toubro (L&T) Limited, Chennai	
11.	**Mr. S. Balaji**, Assistant General Manager, Hyundai Motor India Limited, Chennai.	
12.	**Dr. D. P. Sudhakar** Deputy Director ISRO - Indian Space Research Organization Mahendragiri, Triunelveli District.	R & D Expert
13.	Dr. D. Venkat Kumar, Professor / Mechanical Engineering	Internal Members
14.	Dr. M. Kathiresan, Professor / Mechanical Engineering	
15.	Dr. R. Harichandran, Professor / Mechanical Engineering	
16.	Dr. I. Sankar, Associate Professor / Mechanical Engineering	
17.	Dr. D. Vignesh Kumar, Associate Professor / Mechanical Engineering	
18.	Dr. F. Michael Thomas Rex, Associate Professor / Mechanical Engineering	
19.	Dr. A. Andrews Assistant Professor (S.G) / Mechanical Engineering	
20.	Dr. K. Thoufiq Mohammed, Assistant Professor (S.G) / Mechanical Engineering	
21.	Mr. C. Veera Ajay, Assistant Professor / Mechanical Engineering	
22.	Mr. B. Prince Abraham, Assistant Professor / Mechanical Engineering	
23.	Ms. M. Rajeswari Assistant Professor / Mechanical Engineering	
24.	Mr. N. Muthu Saravanan Assistant Professor / Mechanical Engineering	
25.	Dr. T. Sakthi, Assistant Professor (S.G) / Humanities	
26.	Mr. M. Mohamed Faisal, III Year / Mechanical Engineering	Student Members
27.	Mr. K. Vishnu, III Year / Mechanical Engineering	
28.	Mr. M. Keerthi Kumar, III Year / Mechanical Engineering	

2. The following members could not attend the meeting due to unavoidable reasons and they were granted leave of absence.

1.	**Mr. K. Subramanian,** Team Lead, ELGI Equipments Limited, Coimbatore.	Industrial Experts
2.	**Mr. S. Manikandan,** Senior Engineer, Rolls-Royce Power Systems, Pune	

BoS / MECH 23.1	:	WELCOME ADDRESS AND OPENING REMARKS BY CHAIRMAN, BOARD OF STUDIES, DEPARTMENT OF MECHANICAL ENGINEERING
	:	The Chairman, BOS of the Mechanical Engineering welcomed and introduced the members of 23rd Board of Studies and acknowledged each one of them for sparing their valuable time to attend the meeting.
BoS / MECH 23.2	:	TO DISCUSS ANY SUGGESTIONS / MODIFICATIONS NEEDED IN THE VISION AND MISSION OF DEPARTMENT & PEOs AND PSOs OF B.E. MECHANICAL ENGINEERING
	:	Vision and Mission of the Mechanical Engineering Department, and PEOs and PSOs of B.E. Mechanical Engineering were presented by the Chairman. The Chairman that the modifications the PEOs and PSOs as per the suggestions given by the members in the 22nd BoS meeting will done possibly after getting the feedback from other stakeholders also.
BoS / MECH 23.3	:	TO APPROVE THE ACTON TAKEN REPORT OF THE MINUTES OF TWENTY SECOND BOS MEETING HELD ON 07th DECEMBER, 2024.
	:	The minutes of the **Twenty Second Board of Studies meeting** held on 07th December, 2024 were communicated to the members. The comments given by the members have been incorporated and placed for confirmation. The same was approved in the 22nd Academic Council Meeting. The action taken report of the **Twenty Second Board of Studies meeting** held on 07th December, 2024 has been presented and the same has been approved in the 23rd Board of Studies meeting. (Enclosed in Annexure – I)

BoS / MECH 23.4.1	:	**TO CONFIRM AND APPROVE** B.E. Mechanical Engineering Programme – Syllabus for VI Semester Core Courses under R2023 (Enclosed in Annexure – II)
BoS / MECH 23.4.2	:	**TO CONFIRM AND APPROVE** B.E. Mechanical Engineering Programme– Syllabus for few Programme Elective Courses under R2023 (Enclosed in Annexure – III)
BoS / MECH 23.4.3	:	**TO CONFIRM AND APPROVE** Syllabus for few Open Elective Courses under R2023 (Enclosed in Annexure – IV)
BoS / MECH 23.4.4	:	**TO CONFIRM AND APPROVE** Syllabus for few One Credit Elective Courses under R2023 (Enclosed in Annexure – V)
BoS / MECH 23.4.5	:	**TO CONFIRM AND APPROVE** Syllabus of course to be offered by the Department of Mechanical Engineering in the Vertical under Industrial Internet of Things of ECE Department. (Enclosed in Annexure – VI)
BoS / MECH 23.4.6	:	**TO DISCUSS AND APPROVE** Course Design Document of V Semester Subjects under R2023 (Enclosed in Annexure – VII)
BoS / MECH 23.5	:	**Suggestions Given by the Members**

23.5.1		<u>Design for Manufacture and Assembly</u>
		• The book G. Boothroyd, P. Dewhurst & W. Knight, Product Design for Manufacture and Assembly, 3rd Edition, CRC Press, 2011 may be shifted from the Reference Book list to the Text Book list.
		• Relevant content from the Coursera platform can be added under Reference Materials to enhance online learning support.
		• CO1 content may be reduced to improve clarity.
		• CO4 content may be revised and reorganized as follows:
		  • Machining processes: Turned parts – Drilled parts – Milled, planned, shaped, and slotted parts – Ground parts, followed by
		  • Bulk deformation processes: Metal extruded parts – Impact/Cold extruded parts – Stamped parts – Forged parts.
		• In CO5, the term “AT&T’s” can be removed.

		• The environmental content in CO5 may be removed and reframed into a separate one-credit course titled "Design for Environments." • The subject can be integrated with Project-Based Learning (PBL).
23.5.2	:	<u>Industrial Engineering</u> • In CO4, the topic KANBAN may be placed after the Lean Manufacturing topic. • The CO2 statement may be revised for better alignment with its syllabus content and to enhance consistency and clarity.
23.5.3	:	<u>Engineering Metrology and Measurements</u> • In CO3 content, may be changed as following order: CMM followed by Laser Interferometers, and finally Machine Vision System. • In CO4, the topic profilometer can be added. • There is a mismatch between the CO4 statement and syllabus content: the CO4 statement includes form measurement, but in the content only roundness is mentioned, which is just one aspect of form measurements. • The topic "screw threads measurement" can be moved from CO4 to CO2 and rephrased as "screw threads measurements using tool maker's microscope." • In CO5, the topic "ultrasonic flow measurements" may be added under Flow Measurement, and "infrared thermometer" may be added under Temperature Measurements. • In the CO10 statement, the word "calibrate" may be removed and replaced with a more suitable term that aligns with the syllabus content. • The topic "error percentage" may be included wherever applicable. • Topics in CO1, such as limits, fits, and tolerance, may be moved to CO2 and placed before the topic "limit gauge." • The sequence of topics from "Experimental Methods for Engineers" by Holman J. P., or "Engineering Metrology" by Gupta I. C. may be followed to frame the sequence of CO1 to CO5.

23.5.4	:	**Machine Elements and System Design** • CO1 statement: The phrase "Design and analyze shaft" may be changed to "Design and analyze the shaft" for grammatical clarity. • In CO1, the term "solid" in the topic "Design of solid shafts based on strength" can be removed. The topic may be rephrased as "Design – shafts based on strength." The phrase "of" may be removed wherever applicable throughout the syllabus content (e.g., "Design of solid shafts based on strength" can be revised to "Design – shafts based on strength"). • In CO6, the word "key" in the statement may be replaced with "primary" to better reflect importance or emphasis. • In the CO2 statement, the phrase "based on the given application" can be made more concise or replaced with a more suitable alternative. • In CO6 content, the topic "how to use design data book" may be added to enhance practical understanding. • The topic "tightening torque calculation" can be included under a suitable CO wherever it fits best. • In CO4, the content "Design of flat and V-belt drives – Design of transmission chains and sprockets" may be rephrased as "Design – flat and V-belt drives – Transmission chains and sprockets," and the topic "types of belts" can also be added. • The CO4 statement "Design and select a flexible drive system for a given application" can be revised to "Design and selection of transmission elements" for simplification and consistency. • CO5 and CO8 statements may be simplified to make them short and clear. • In the CO8 statement, the term "actual" may be replaced with "real-life component" for better contextual clarity. • In the text or reference list, "A Textbook of Machine Design" by R. S. Khurmi and J. K. Gupta can be added.

		• The syllabus can include the relevant NPTEL course name along with the professor's name, followed by the course link for student reference.
23.5.5		<u>Computer Aided Analysis</u> • The Course title "Computer Aided Analysis" may be changed to "Finite Element Analysis". • The reference book - T. R. Chandrupatla and A. D. Belegundu, "Introduction to Finite Elements in Engineering", Pearson, 2021 can be moved to the Textbook section. • The textbook Rao, S.S., The Finite Element Method in Engineering, 6th Ed., Elsevier Butterworth-Heinemann, 2017 may be moved to the Reference Books section. • Practical Finite Element Analysis by Nitin S. Gokhale, 2020 can be added to the Reference Books section to provide additional practical insights. • The reference book Tadeusz Stolarski, Y. Nakasone, S. Yoshimoto, "Engineering Analysis with ANSYS Software", Butterworth-Heinemann (Elsevier), 2018 may be removed from the syllabus if deemed less relevant.
23.5.6	:	<u>Product Development Practice</u> • The word "practice" in the title may be removed, or the title can be changed to either "Product Design and Development" or "Hands-on Experience on Product Development" for better clarity and relevance. • The CO1 statement "Identify and analyze real-world problems using empathy techniques and reverse engineering approaches" may be simplified to "Identify and analyze real-world problems" to keep it more focused and concise. • The CO2 statement "Apply forward engineering to develop innovative solutions, focusing on technical feasibility, patentability, and market potential" can be revised to "Apply forward engineering to develop innovative solutions" to streamline the learning outcome.
23.5.7	:	<u>Solar Photovoltaic Energy Conversion</u> • CO1, CO2, and CO3 content can be simplified and reduced. • CO1, CO2, CO3, and CO5 statements can be shortened.

		• In CO5 syllabus content, change the phrase "Performance prediction" to "Performance prediction and optimization".
23.5.8	:	<u>Cogeneration and Waste Heat Recovery</u> • CO4 statement and content are mismatched; the CO4 statement may be updated to align with the content. • In CO1, the topic "heat to power ratio" may be added. • In CO1 syllabus content, the word "combined" may be removed from the second line. • The topic Integrated Gasification Combined Cycle (IGCC) in CO1 can be added. • Handbook on Bureau of Energy Efficiency, Volume 2 and Volume 4 can be added to the Reference Books section.
23.5.9	:	<u>Energy Efficient Buildings</u> • In CO4, the phrase "building loads" may be changed to "thermal loads" for more accurate technical terminology. • CO1 and CO2 can be assigned to cover civil engineering content, while CO3, CO4, and CO5 may be designated for mechanical engineering topics to ensure a balanced interdisciplinary approach. • CO5 can include some practical content to enhance application-based understanding and strengthen experiential learning.
23.5.10	:	<u>Mechanics of Robots</u> • The topic "Industry 5.0" may be added under CO1 • The word "definition" in CO1 can be removed to make the content more action-oriented and streamlined. • The reference book Industrial Robotics by Mikell P. Groover may be added to the Reference Books section.
23.5.11	:	<u>Piping Engineering</u> • In CO7 syllabus content, the phrase "using software" may be removed if not applicable. • CO7 statement can be revised to: "Thickness calculation and validation using codes and standards." • CO1 statement may be revised.
23.5.12	:	<u>Additive Manufacturing</u> • In CO1 syllabus content, the topic "BTF Ratio (Buy to Fly ratio)" may be added. • In CO2, the topic "Organ bio-printing (Bio Ink)" can be added before "Case Study". • In CO2, "Topology Optimization" may be changed to "Topology Optimization – Generative Design".

		• In CO4 syllabus content, "Arc-based technology" can be added under Directed Energy Deposition (DED) processes.
		• In CO5 syllabus content, the topic "Acceptance Criteria" may be added.
		• The order of Course Outcomes (COs) can be changed as follows:
		  • CO3 to CO2
		  • CO5 to CO3
		  • CO2 to CO5

23.5.13		**Marketing Management** • Textbooks related to digital marketing may be added to support CO4 content. • At least one textbook by an Indian author can be included in the syllabus. • In CO5 syllabus content, the word "Final" may be removed.
23.5.14		**Accounting for Engineers** • The course title may be changed to a more suitable name. • In CO4 syllabus content, the topics ARR (Accounting Rate of Return), Discounted Payback Period, and Depreciation can be added in an appropriate place. • The reference book Projects: Planning, Analysis, Selection, Financing, Implementation, and Review by Prasanna Chandra may be added.
23.5.15		**Entrepreneurship** • The Course Title may be changed from “Entrepreneurship” to “Entrepreneurship Development”.
23.5.16		**Design of Experiments** • The topic "Taguchi Technique" may be added to the syllabus content at an appropriate place.
23.5.17		**Carbon Capture** • CO1 statement may be revised. • In CO1 syllabus content, the topic "Carbon Credit" can be added in an appropriate place.
23.5.18		**Design a Startup** • The course title may be changed from “Design a Startup” to “Startup and New Venture Management”, “Business Startup”, “Structuring a Startup”, or “Guidance on Startup”.
23.5.19		**Fundamentals of Mechatronics and Robotics** • The NPTEL author name, course title, followed by the link may be added to the syllabus.

The student members from the third year B.E. Mechanical Engineering program presented their views on the R2023 curriculum and its courses. They pointed out that the R2023 curriculum, particularly the concept of integrated courses and project-based courses, will provide greater insight and help enhance their skills, leading to better career opportunities. They also emphasized the need to incorporate more project-based learning wherever applicable.

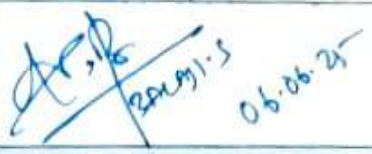
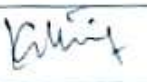
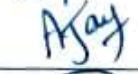
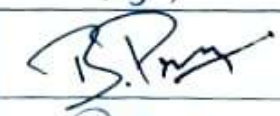
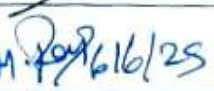
The members had a brainstorming discussion and interaction among themselves. After discussion, Board of Studies of Mechanical Engineering resolved to recommend the changes in syllabus for the VI semester core courses (Annexure II) and few programme elective courses (Annexure III) prescribed for B.E. Mechanical Engineering under Regulation 2023, syllabus of few open elective courses prescribed for all U.G. Programmes (Annexure IV) under Regulation 2023, few one credit courses (Annexure V) prescribed for B.E. Mechanical Engineering under Regulation 2023, List of Course to be offered by the Department of Mechanical Engineering in the Vertical under Industrial Internet of Things (Annexure – VI), course design document for V semester core courses under R2023 (Annexure VII).

After carrying out the modifications suggested by the members, it will be presented to the Academic Council for further approval.

Dr. D. Venkatkumar, Professor / Mechanical Engineering proposed vote of thanks for their kind cooperation and the meeting came to an end.

Members Present for the 23rd BoS Meeting of Mechanical Engineering on 06.06.2025

CHAIRMAN	
Dr. S. Iyahraja, Professor & Head / Mechanical Engineering, NEC	6/6/25
UNIVERSITY NOMINEE	
Dr. D Samuel Raj, Associate Professor / Mechanical Engineering, CEG Campus, Anna University, Chennai.	D Samuel 6/6/25
ACADEMIC EXPERTS	
Dr. M. Venkata Ramanan, Professor & Director / Institute for Energy Studies, CEG Campus, Anna University, Chennai.	6/6/25
Dr. C. Prathap, Professor / Aerospace Engineering, Indian Institute of Space Science & Technology, Thiruvananthapuram.	6 JUN 2025
Dr. N.Siva Shanmugam, Professor / Mechanical Engg., NIT Trichy.	06/06/2025
Dr. K.Hariharan, Associate Professor / Mechanical Engineering, IIT Madras.	
MERITORIOUS ALUMNUS NOMINATED BY THE PRINCIPAL	
Mr. K Monickavasagom Pillai, ~~Senior Principal~~ Chief Scientist, CSIR –National Aerospace Laboratories, Bengaluru.	
INDUSTRIAL EXPERTS	
Mr. V. Hari Babu, Senior Vice President, Head of Engineering & DOA Delegations Responsible Axiscades Technologies Ltd, Bengaluru.	
Mr. S. Ravikumar, Chief Research & Innovation Testing and Validation, Iniciotek Private Limited, Chennai.	06.06.'25

Mr. A T Paary, Deputy General Manager/Mechanical - Static Dept., Larsen & Toubro (L&T) Limited, Chennai	
Mr. S.Balaji, Assistant General Manager, Hyundai Motor India Limited, Chennai.	
R & D EXPERT	
Dr. D. P. Sudhakar Deputy Director ISRO - Indian Space Research Organization Mahendragiri, Triunelveli District.	
INTERNAL MEMBERS	
Dr. D.Venkat Kumar, Professor / Mechanical Engineering	
Dr. M. Kathiresan, Professor / Mechanical Engineering	
Dr. R.Harichandran, Professor / Mechanical Engineering	
Dr. I.Sankar, Associate Professor / Mechanical Engineering	
Dr. D.Vignesh Kumar, Associate Professor / Mechanical Engineering	
Dr.F.Michael Thomas Rex, Associate Professor / Mechanical Engineering	
Dr.A.Andrews, Assistant Professor (S.G) / Mechanical Engineering	
Dr. K.Thoufiq Mohammed, Assistant Professor (S.G) / Mechanical Engineering	
Dr.C.Veera Ajay, Assistant Professor (S.G) / Mechanical Engineering	
Mr. B.Prince Abraham, Assistant Professor / Mechanical Engineering	
Ms.M.Rajeswari Assistant Professor / Mechanical Engineering	
Mr.N.Muthu Saravanan Assistant Professor / Mechanical Engineering	

Dr. T. Sakthi, Assistant Professor (S.G) / Humanities	
STUDENT MEMBERS	
Mr. M. Mohamed Faisal, III Year / Mechanical Engineering	
Mr. K. Vishnu, III Year / Mechanical Engineering	
Mr. M. Keerthi Kumar, III Year / Mechanical Engineering	

CHAIRMAN
BOARD OF STUDIES/MECH. ENGG.
Dr. S. IYAHRAJA M.Tech. (IITM), Ph.D.,
Professor & Head,
Dept. of Mechanical Engineering,
National Engineering College,
K.R. Nagar, Kovilpatti - 628 503.

23rd BOARD OF STUDIES MEETING

DEPARTMENT OF MECHANICAL ENGINEERING ON 06.06.2025

23rd BOARD OF STUDIES MEETING - DEPARTMENT OF ECE ON 31.05.2025

23rd BOARD OF STUDIES MEETING - DEPARTMENT OF CSE, IT

&

5th BOARD OF STUDIES MEETING - DEPARTMENT OF AI&DS ON 17.05.2025

23rd BOARD OF STUDIES MEETING - DEPARTMENT OF EEE ON 14.06.2025

20th BOARD OF STUDIES MEETING - DEPARTMENT OF CIVIL ENGINEERING ON 05.06.2025

23rd ACADEMIC COUNCIL MEETING ON 28.06.2025