

Department of Mechanical Engineering

MINUTES of 18<sup>th</sup> Meeting of Board of Studies held on  
23<sup>th</sup> December, 2022 at 10.30 a.m.

Venue: Conference Hall,  
National Engineering College

**National Engineering College, K.R.Nagar, Kovilpatti – 628 503**  
*(An Autonomous Institution - Affiliated to Anna University, Chennai)*  
[www.nec.edu.in](http://www.nec.edu.in)

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**18<sup>th</sup> Board of Studies Meeting**  
**Department of Mechanical Engineering**

Venue: Conference Hall,  
National Engineering College

Date & Time: 23.12.2022 & 10.30 a.m.

**AGENDA**

BoS / MECH18.1	:	Welcome address and Opening Remarks by Chairman, Board of Studies, Department of Mechanical Engineering
BoS / MECH18.2	:	Action taken report of 17 <sup>th</sup> meeting of Board of Studies
BoS / MECH18.3	:	Business brought forward by the Chairman, Board of studies
	18.3.1	Verticals for awarding Honours, Honours with specialization and Minor degree under R 2019.
	18.3.2	Syllabus for Professional Elective Courses for UG degree Programmes under R-2019
	18.3.3	Additional Elective courses for PG degree programmes under R-2019.
BoS / MECH18.4	:	Suggestions given by the BOS Members
BoS / MECH18.5	:	Any other items

**National Engineering College, K.R.Nagar, Kovilpatti – 628 503**  
(An Autonomous Institution - Affiliated to Anna University, Chennai)

F. No. 1-1/NEC/ MECH

23<sup>rd</sup> December, 2022

Dear Sir/Madam,

**Sub: Minutes of the 18<sup>th</sup> Meeting of Board of Studies in the Mechanical Engineering - Reg.**

Kindly find attached herewith the Minutes of the 18<sup>th</sup> Meeting of Board of Studies of Mechanical Engineering of National Engineering College, K.R.Nagar, Kovilpatti – 628503 held on 23<sup>rd</sup> December 2022 at 10.30 a.m. in Conference Hall, National Engineering College. Hard copy of the Minutes is also being sent to you by speed post.

It is requested that comments on the Minutes, if any, may please be sent by email at [hodmech@nec.edu.in](mailto:hodmech@nec.edu.in) or by post, at the earliest. If no comments are received, within ten days, the Minutes shall be taken as confirmed.

Yours Sincerely,

*h.u - 23/12/22*  
(Dr.K.Manisekar)

**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 18<sup>th</sup> Meeting of the Board of Studies of the Mechanical Engineering was held on 23<sup>rd</sup> December 2022 at 10.30.00 a.m.in the Conference Hall, National Engineering College, K.R.Nagar, Kovilpatti – 628 503

1. The following members were present

1.	Dr.K.Manisekar, Professor & Head, Department of Mechanical Engg.	Chairman
2.	Dr. K. Srithar, Professor, Department of Mechanical Engineering, Thiagarajar College of Engineering, Madurai – 625015.	University Nominee
3.	Dr. M. Venkata Ramanan, Professor & Director Institute for Energy Studies, CEG, Anna University, Chennai–600025	Academic Experts
4.	Dr.-Ing. M. Duraiselvam, Professor / Production Engineering, National Institute of Technology, Tiruchirappalli	
5.	Dr.A.Arockiarajan, Professor / Applied Mechanics, Indian Institute of Technology Madras, Chennai	
6.	Dr. K. Murugan, Scientist –E, Centre for Sol-Gel Coatings, ARCI, Hyderabad – 500 005, Telangana.	Meritorious Alumnus Nominated by the Principal
7.	Mr. R. Kanda Subburaj, Managing Director, Gulf Asia Engineering and Projects Pvt. Ltd, Chennai.	Industrial Experts
8.	Mr. Sivaram Sundaram, Senior Director, Comcast India Engineering Centre, Thoraipakkam, Chennai - 97	

9.	Dr.S.Iyah Raja, Professor / Mechanical Engineering	Internal Members
10.	Dr. D.Venkat Kumar, Professor / Mechanical Engineering	
	Dr. R.Harichandran, Professor / Mechanical Engineering	
11.	Dr. M.Kathiresan, Professor / Mechanical Engineering	
12.	Dr. P.Ramanan, Assistant Professor (S.G) / Mechanical Engineering	
13.	Dr. D.Vignesh Kumar, Assistant Professor (S.G) / Mechanical Engineering	
14.	Dr.F.Michael Thomas Rex, Assistant Professor (S.G) / Mechanical Engineering	
15.	Dr. W.Beno Wincy, Assistant Professor / Mechanical Engineering	
16.	Mr. S.R. Sundara Bharathi, Assistant Professor / Mechanical Engineering	
17.	Mr. K.Thoufiq Mohammed, Assistant Professor / Mechanical Engineering	
18.	Mr.C.Veera Ajay, Assistant Professor / Mechanical Engineering	Student Members
19.	S. Manivannan, IV Year / Mechanical Engineering	
20.	S. Keerthivasan, IV Year / Mechanical Engineering	
21.	R.T. Ezhil Azhagan, III Year / Mechanical Engineering	

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

1.	Mr.P.Muniyandi, Principal Scientific Officer, Controllerate of Quality Assurance (Ordnance Factory Vehicles) Jabalpur- 482009, Madhya Pradesh.	Industrial Experts
2.	Mr.P.S.Sriram, Joint Executive President Ultratech in Aditya Birla Group, Pune, Maharashtra.	

BoS / MECH 18.1	:	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 18 <sup>th</sup> Board of Studies and thanked each one of them for sparing their valuable time to attend the meeting.
BoS / MECH 18.2	:	TO CONFIRM THE MINUTES OF SEVENTEENTH BOS MEETING HELD ON 09 <sup>th</sup> July, 2022
		The minutes of the Seventeenth Board of Studies meeting held on 09 <sup>th</sup> July, 2022 were communicated to the members. The comments given by the members have been incorporated and placed for confirmation. The same was approved by the 17 <sup>th</sup> Academic council. (Enclosed in Annexure – I)
BoS / MECH 18.3.1	:	TO CONFIRM AND APPROVE Verticals for awarding Honours, Honours with specialization and Minor degree under R 2019. (Enclosed in Annexure – II)
BoS / MECH 18.3.2	:	TO CONFIRM AND APPROVE Syllabus for Professional Elective Courses for UG degree programmes under R-2019. <ul style="list-style-type: none"> <li>• Surface Engineering</li> <li>• Precision Engineering</li> <li>• Warehouse Management</li> <li>• Material Handling Equipments Repair and Maintenance</li> <li>• Energy Efficient Buildings</li> </ul> (Enclosed in Annexure – III)
BoS / MECH 18.3.3	:	TO CONFIRM AND APPROVE Additional Elective courses for PG degree programmes under R-2019. <ul style="list-style-type: none"> <li>• Solar Energy Conservation Technologies</li> <li>• Computational Fluid Dynamics for Energy Systems</li> </ul> (Enclosed in Annexure – IV)
BoS / MECH 18.4	:	Suggestions Given by the Members
18.4.1	:	Regulations for Honours, Honours with Specialization and Minor Degree were presented to the BoS Members

	<p>Minor Degree – Basic Courses of Mechanical Engineering can be offered in the department so that other department students can take up the courses.</p>
<p>18.4.2 :</p>	<ul style="list-style-type: none"> <li>• Hydrogen Energy, Energy Conservation in Industries and Hybrid E Vehicles can be Added in the Vertical “1”, “Clean and Green Technology”.</li> <li>• Energy Storage System can be added in the vertical “Thermal System” and “Applied Nano Technology” can be common course for the Vertical “1 &amp; 2”.</li> <li>• Internal Combustion Engines can be removed from the vertical “2” Thermal System.</li> <li>• Digital Electronics for Engineers in the vertical “Modern Mobility Systems” can be renamed as Fundamental of Digital Electronics for Mechanical Engineers.</li> <li>• Modeling and Simulation in the vertical “5” is more generic and it could common for vertical “5&amp;6”.</li> <li>• Marketing Management can be added in the vertical “7” and Statistical Quality Control can be removed and a separate unit can be included in the Total Quality Management.</li> </ul> <p><b>Precision Engineering</b></p> <ul style="list-style-type: none"> <li>• Unit I – Introduction, Requirements of the course, Importance for the defence and space can be added.</li> <li>• Unit V Syllabus – is enormous and it can be reduced.</li> </ul> <p><b>Surface Engineering</b></p> <ul style="list-style-type: none"> <li>• Surface modification technologies can be fully concentrated and the syllabus can be reoriented.</li> <li>• Process based units may be framed like coating and Thermal Spray Based on Process Texturing etc.</li> <li>• Industrial Safety Engineering course may be added in the vertical 7 “Industrial Management”</li> </ul> <p><b>Material Handling Equipments</b></p> <ul style="list-style-type: none"> <li>• Conveyor and its types can be added in unit II</li> <li>• Use of computer in maintenance Can be redefined</li> </ul>

		<ul style="list-style-type: none"> <li>• Drone and Robot Material handling may be added</li> <li>• The word quarries can be removed in Unit II</li> </ul> <p><b>Ware House management</b></p> <ul style="list-style-type: none"> <li>• Unit II Title rename as “Retail Warehousing”</li> <li>• Role of Government in warehousing can be changed as “Regulations in ware housing”</li> </ul> <p><b>Energy Efficient Buildings</b></p> <ul style="list-style-type: none"> <li>• Unit I – Introduction should be modified.</li> <li>• Building Management system and Building Automation may be added.</li> <li>• Unit V can be modified for the “Renewable Energy in Buildings”</li> </ul> <p><b>Solar Energy Conservation Technologies</b></p> <ul style="list-style-type: none"> <li>• Design of PV Systems in unit V is to be added in Unit III and Unit IV.</li> <li>• Unit V to be titled as “Solar Appliances” wherein all solar energy appliances are to be discussed viz., Cookers, Water Heaters, Refrigerators, VARS based ACs, Pumps, Stills, Desalination Systems, Furnaces, Dryers, Hot Air Generators etc.,</li> </ul>
BoS / MECH18.5	:	<b>Any other items</b>
18.5.1	:	<ul style="list-style-type: none"> <li>• Separate Code System can be followed for Minor Degree courses.</li> <li>• Vertical “9”, Industrial Monitoring and Control can be removed. Since there are more number of verticals.</li> <li>• Internship / In plant Training and Project work and Industry Practice were discussed.</li> </ul>

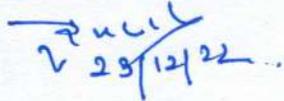
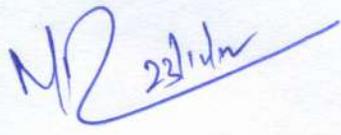
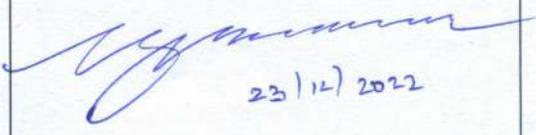
The members had a brainstorming discussion and interaction among themselves. After discussion, fruitful suggestions were incorporated appropriately in the curriculum and syllabus of R2019.

After discussion, BoS resolved to recommend the verticals prescribed in Mechanical Engineering (Annexure II) after carry out the modifications suggested by the members.

Based on the suggestions given by the members, BOS resolved to recommend the Syllabus for Professional elective course courses – B.E. Mechanical Engineering Programme under Regulation 2019 and Additional Elective courses for PG degree programmes under R-2019 to the Academic Council for further approval.

Dr. R.Harichandran, Professor / Mechanical Engineering proposed vote of thanks for the kind cooperation of the members and the meeting came to an end.

**Members Present**

<b>CHAIRMAN</b>	
Dr.K.Manisekar, Professor & Head / Mechanical	 h.u - 86 23/12/22
<b>UNIVERSITY NOMINEE</b>	
Dr. K. Srithar, Professor, Department of Mechanical Engineering, Thiagarajar College of Engineering, Madurai – 625015.	 K. Srithar 23/12/22
<b>ACADEMIC EXPERT</b>	
Dr. M. Venkata Ramanan, Professor & Director Institute for Energy Studies, CEG, Anna University, Chennai-600025	 M/R 23/12/22
Dr.-Ing. M. Duraiselvam Professor / Production Engineering, National Institute of Technology, Tiruchirappalli	 M. Duraiselvam 23/12/22
Dr.A.Arockiarajan Professor / Applied Mechanics, Indian Institute of Technology, Chennai	 A. Arockiarajan
<b>MERITORIOUS ALUMNUS NOMINATED BY THE PRINCIPAL</b>	
Dr. K. Murugan, Scientist -E, Centre for Engineering Coatings, ARCI, Hyderabad – 500 005, Telangana.	 K. Murugan 23/12/2022

**INDUSTRIAL EXPERTS**

Mr. R. Kanda Subburaj  
Managing Director,  
Gulf Asia Engineering and Projects Pvt. Ltd,  
Chennai.

R. Kanda

Mr. Sivaram Sundaram,  
Senior Director,  
Comcast India Engineering Centre,  
Thoraipakkam, Chennai - 97

Sivaram  
23/12/2022

**INTERNAL MEMBERS**

Dr.S.Iyah Raja,  
Professor/Mechanical

Iyah Raja  
23/12/22

Dr. D.Venkat Kumar,  
Professor/Mechanical

D. Venkat Kumar

Dr. R.Harichandran,  
Professor/ Mechanical

R. Harichandran

Dr.M.Kathiresan,  
Associate Professor/Mechanical

Kathiresan  
23/12/22

Dr. P.Ramanan,  
Assistant Professor (S.G)/Mechanical

P. Ramanan

Dr. D.Vignesh Kumar,  
Assistant Professor (S.G)/Mechanical

D. Vignesh Kumar

Dr.F.Michael Thomas Rex,  
Assistant Professor (S.G)/Mechanical

F. Michael Thomas Rex

Dr.W.Beno Wincy,  
Assistant Professor/Mechanical

Beno Wincy

Mr.S.R.Sundara Bharathi,  
Assistant Professor/Mechanical

S. R. Sundara Bharathi

Mr.A.Andrews,  
Assistant Professor/Mechanical

A. Andrews

Mr. K.Thoufiq Mohammed,  
Assistant Professor/Mechanical

K. Thoufiq Mohammed

Mr.C.Veera Ajay,  
Assistant Professor/Mechanical

Ajay

<b>STUDENT MEMBERS</b>	
Mr. S. Manivannan, IV Year / Mechanical	S. Mani 23-12-22
Mr. S. Keerthivasan, IV Year / Mechanical	S. Keerthivasan 23-12-2022
Mr. R.T. EzhilAzhagan, IV Year / Mechanical	Ezhil Azhagan 23/12/2022

h.u - 82  
23/12/22  
**CHAIRMAN**  
**BOARD OF STUDIES**

## ANNEXURE – I

### Action taken for Minutes of 17<sup>th</sup>BoS Meeting

Sl.No	Suggestions by BOS Committee	Action Taken
1.	<p>“Project Management and Finance”</p> <ul style="list-style-type: none"> <li>• Finance management shall be considered to be offered as an exclusive elective.</li> <li>• The topic Big data analytics in the unit 3 was suggested to be removed considering the relevance.</li> <li>• Financial feasibility, analytics and capital budgeting shall be included.</li> <li>• Product based mini projects shall be offered to the students.</li> </ul>	<p>Incorporated in syllabus</p> <p>The topic big data analytics removed</p> <p>Financial feasibility, analytics and capital budgeting were incorporated in Unit 5</p>
2.	<p>“Indian Economy” – The Syllabus coverage shall be ensured in the listed reference books.</p>	<p>Syllabus coverage ensured and added in the reference books in reference section</p>
3.	<p>“Sustainable developments and practices” - Suggested to include 17 goals of sustainable development.</p>	<p>The topics were included in “Sustainable developments and practices”</p>
4.	<p>R2019 – project Phase - I and Project Phase – II</p> <ul style="list-style-type: none"> <li>• The quality of projects and involvement of faculty and the external supervisors from industry shall be ensured.</li> <li>• Suggested to redefine the process of project.</li> <li>• Suggested to brainstorm the project batches in the 5<sup>th</sup> semester itself.</li> </ul>	<p>Incorporated</p>
5.	<p>Curriculum structure for R2023 has been discussed.</p> <ul style="list-style-type: none"> <li>• Suggested to include AI, ML Machine vision topics in core subjects.</li> <li>• Suggested to provide programming basics to the students.</li> </ul> <p>Suggested to provide industry related problems as student projects.</p>	<p>Yet to be implemented</p>

## ANNEXURE - II

VERTICALS FOR HONOURS DEGREE / HONOURS DEGREE WITH SPECIALIZATION / MINOR DEGREE								
National Engineering College, K.R.Nagar, Kovilpatti – 628503 - Department of Mechanical Engineering								
PROFESSIONAL ELECTIVE COURSES VERTICALS								
Sl No.	Vertical 1	Vertical 2	Vertical 3	Vertical 4	Vertical 5	Vertical 6	Vertical 7	Vertical 8
	<i>CLEAN AND GREEN TECHNOLOGY</i>	<i>THERMAL SYSTEM</i>	<i>MODERN MOBILITY SYSTEMS</i>	<i>ROBOTICS AND AUTOMATION</i>	<i>PRODUCT &amp; PROCESS DEVELOPMENT</i>	<i>MANUFACTURING ENGINEERING</i>	<i>INDUSTRIAL MANAGEMENT</i>	<i>LOGISTICS AND SUPPLY CHAIN MANAGEMENT</i>
1	Renewable Energy Sources	Refrigeration System	Automobile Engineering	Introduction to Robotics	Product Design and Development	Unconventional Machining Processes	Principles of Management	Operations Research
2	Solar Photovoltaic Energy Conversion	Heating Ventilation and Air Conditioning Systems	Automotive Electronics	Mechanics of Robots	New Product Development	Welding Technology	Total Quality Management	Supply Chain and Logistic Management
3	Cogeneration and Waste Heat Recovery	Design of Heat Exchanger and Pressure Vessel	Hybrid Electrical Vehicles	Control of Robotic Systems	Design for Manufacture, Assembly and Environments	Quality Control of Welded Structures	Implementation of Quality Management System	Ecommerce
4	Power Plant Engineering	Thermal Design and Management of Electronic Equipments	Vehicle Systems Design	Electrical Drives and Control	Product Life Cycle Management	Non-Destructive Evaluation	Marketing Management	Warehouse Automation
5	Energy Conservation in Industries	Turbo machines	Fundamentals of Digital Electronics	Mechatronics	Piping Design Engineering	Additive Manufacturing	Production Planning and Control	Production and Operations Management
6	Energy Storage Systems	Computational Fluid Dynamics	Thermal Management of Batteries and Fuel Cells	Hydraulics and Pneumatics	Computer Graphics and Virtual Reality	Lean Manufacturing	Process Planning and Cost Estimation	Material Handling Equipments Repair and Maintenance
7	Applied Nano Technology	Gas Dynamics and Propulsion Systems	Automotive Materials Components Design and Testing	MEMS Devices – Design and Fabrication	Modelling and Simulation	Machine Tool Control	Engineering Economics and Cost Analysis	
8	Energy Efficient Buildings	Energy Storage System		Industry 4.0	Advanced Modeling Techniques	Precision Engineering	Accounting for Engineers	
9	Hydrogen Energy	Applied Nano Technology		Microprocessor, Microcontroller and Applications	Materials Technology	Computer Integrated Manufacturing	Human Resource Management	
10	Hybrid Electrical Vehicles	Thermal Management of Batteries and Fuel Cells				Modelling and Simulation	Industrial Psychology and Organizational Behavior	
11	Fuel Cells					Materials Technology	Industrial Safety Engineering	

## ANNEXURE - II

VERTICALS FOR HONOURS DEGREE / HONOURS DEGREE WITH SPECIALIZATION / MINOR DEGREE								
National Engineering College, K.R.Nagar, Kovilpatti – 628503 - Department of Mechanical Engineering								
PROFESSIONAL ELECTIVE COURSES VERTICALS								
Sl No.	Vertical 1	Vertical 2	Vertical 3	Vertical 4	Vertical 5	Vertical 6	Vertical 7	Vertical 8
	<i>CLEAN AND GREEN TECHNOLOGY</i>	<i>THERMAL SYSTEM</i>	<i>MODERN MOBILITY SYSTEMS</i>	<i>ROBOTICS AND AUTOMATION</i>	<i>PRODUCT &amp; PROCESS DEVELOPMENT</i>	<i>MANUFACTURING ENGINEERING</i>	<i>INDUSTRIAL MANAGEMENT</i>	<i>LOGISTICS AND SUPPLY CHAIN MANAGEMENT</i>
1	Renewable Energy Sources	Refrigeration System	Automobile Engineering	Introduction to Robotics	Product Design and Development	Unconventional Machining Processes	Principles of Management	Operations Research
2	Solar Photovoltaic Energy Conversion	Heating Ventilation and Air Conditioning Systems	Automotive Electronics	Mechanics of Robots	New Product Development	Welding Technology	Total Quality Management	Supply Chain and Logistic Management
3	Cogeneration and Waste Heat Recovery	Design of Heat Exchanger and Pressure Vessel	Hybrid Electrical Vehicles	Control of Robotic Systems	Design for Manufacture, Assembly and Environments	Quality Control of Welded Structures	Implementation of Quality Management System	Ecommerce
4	Power Plant Engineering	Thermal Design and Management of Electronic Equipments	Vehicle Systems Design	Electrical Drives and Control	Product Life Cycle Management	Non-Destructive Evaluation	Marketing Management	Warehouse Automation
5	Energy Conservation in Industries	Turbo machines	Fundamentals of Digital Electronics	Mechatronics	Piping Design Engineering	Additive Manufacturing	Production Planning and Control	Production and Operations Management
6	Energy Storage Systems	Computational Fluid Dynamics	Thermal Management of Batteries and Fuel Cells	Hydraulics and Pneumatics	Computer Graphics and Virtual Reality	Lean Manufacturing	Process Planning and Cost Estimation	Material Handling Equipments Repair and Maintenance
7	Applied Nano Technology	Gas Dynamics and Propulsion Systems	Automotive Materials Components Design and Testing	MEMS Devices – Design and Fabrication	Modelling and Simulation	Machine Tool Control	Engineering Economics and Cost Analysis	
8	Energy Efficient Buildings	Energy Storage System		Industry 4.0	Advanced Modeling Techniques	Precision Engineering	Accounting for Engineers	
9	Hydrogen Energy	Applied Nano Technology		Microprocessor, Microcontroller and Applications	Materials Technology	Computer Integrated Manufacturing	Human Resource Management	
10	Hybrid Electrical Vehicles	Thermal Management of Batteries and Fuel Cells				Modelling and Simulation	Industrial Psychology and Organizational Behavior	
11	Fuel Cells					Materials Technology	Industrial Safety Engineering	