VIGNAN'S
Foundation for Science, Technology & Research
(Deemed to be University)
(Estd. u/s 3 of UGC Act 1956)

DEPARTMENT OF MECHANICAL ENGINEERING

Date: 25.06.2022

Minutes of Board of Studies Meeting

Board of Studies (BoS) meeting of B.Tech., Mechanical Engineering programme was conducted on 25.06.2022 in blended mode from 9.30 am to 1.00 pm. The venue of the meeting is AGF-06, Seminar Hall, Department of Mechanical Engineering, U-Block, VFSTR, Vadlamudi.

The ZOOM online link for the meeting is
https://us02web.zoom.us/j/85379839604?pwd=R_3nE1FNgPLXnw7jztAc-9HMfRKsEq.1.

Agenda of the BoS Meeting:

1. To Discuss and finalize the curriculum structure and detailed syllabus of B.Tech., Mechanical Engineering Programme for the regulation 2022.
2. To approve the R22 curriculum and syllabus of B.Tech., Mechanical Engineering Programme and recommend to the Academic council.
3. Any other points with the permission of Chairperson.

The following members were present either through offline or online.

S.No	Name and Designation of the members	Position	Signature
1	Dr. L S Raju, Professor and Head of the Department	Chairperson	
2	Mr. Suroju Ramakrishna, Principal Consultant, Tech Mahindra, Pune	External Member (Industry)	Attended in online mode
3	Dr. Jayabal K, Associate Professor, Department of Mechanical Engineering, IIITDM, Kancheepuram	External Member (Academic)	Attended in online mode
4	Dr. M Ramakrishna, Professor	Member	
5	Dr. K Venkat Rao, Professor and Dean R&D Nominee	Member	
6	Dr. D Satyanarayana, Professor	Member	
7	Dr. B Nageswara Rao, Professor	Member	
8	Dr. K Balamurugan, Professor	Member	
9	Dr. G Suresh, Associate Professor	Member	
10	Dr. D Vinay Kumar, Associate Professor	Member	
11	Mr. T Ch Anil Kumar, Assistant Professor	Member	
12	Dr. Sk Farooq, Assistant Professor, School Dean Nominee	Member	
13	Mr. N B Prakash T, Assistant Professor, HoD Nominee	Member Secretary	

The following members have taken leave of absence:

1. Dr. D Benny Karunakar, Associate Professor, Department of Mechanical and Industrial Engineering, IIT Roorkee - External Member (Academic)
2. Mr. Subrata Karmakar, President-Head, Robotics and Discrete Automation Business, ABB India Ltd., Bengaluru, Karnataka - External Member (Industry)

Chairperson Dr. L S Raju, Professor and Head, department of Mechanical Engineering, VFSTR opened the meeting by welcoming and introducing the external members, invitees to the internal members. Chairperson presented about the *NEP 2020 Compliant Regulation - R22* which emphasis on creating *learning centric* (continuous learning and continuous assessment model), offering B.Tech., B.Tech. with Honours/ Research Honours/ Minor/ Add-on Diploma, *Dual degree* (B.Tech. + M.Tech./MBA, or M.Tech. + Ph.D.), providing multiple entry and multiple exits.

The following points were discussed in the BoS meeting:

1. Regulation R22.
2. Curriculum structure with credits, credits distribution.
3. 2 Modules instead of 5 units.
4. Assessment methods (Formative & Summative).
5. Grading Schemes.
6. Department pool of Electives.
7. Minor / Honor courses.
8. Open Electives.
9. Dr. Jayabal K suggested to keep Transaction for Mathematics – I
10. Engineering Mechanics: Members made the following suggested
    - Hours allotment for covering unit 1 in module 1 are more, that can be reduced.
    - Need to include 2D and 3D bodies
    - Kinematics should be added in Module 2
    - Rearrange of L&T hours
    - Beer & Johnson "Vector Mechanics for Engineers" should be added to text books
11. Manufacturing Sciences: Mr. Suroju Ramakrishna suggested to add Plastic moulding design & applications
12. Computer Aided Design: Dr. Jayabal K suggested to modify the title to FEM and made the following modifications
    - In Module 1 remove topics related to 2D FEM
    - Include Thermal Analysis
    - In Module 2 instead of 3D keep 2D only
13. Design of Shape Memory Alloy Actuators can be changed to Design of Smart Actuators with inclusion of Piezo Electrical Actuators and Magnetostrictive Actuators

The following resolutions made after the discussion:

1. BoS Members approved the revised regulations, curriculum structure, syllabus of B.Tech., Mechanical Engineering programme and it follows based on the NEP 2020. Curriculum structure is provided in Appendix-I.
2. Major restructuring has taken place in the curriculum which is oriented towards continuous learning and assessment based on Module structure.
3. Major reformation has taken place in the curriculum by offering Honours/Specialization degree or Minor degree thorough 20 more credits with additional courses.
4. The curriculum is encompassing the courses that enable employability or entrepreneurship or skill development, provided in Appendix- II.

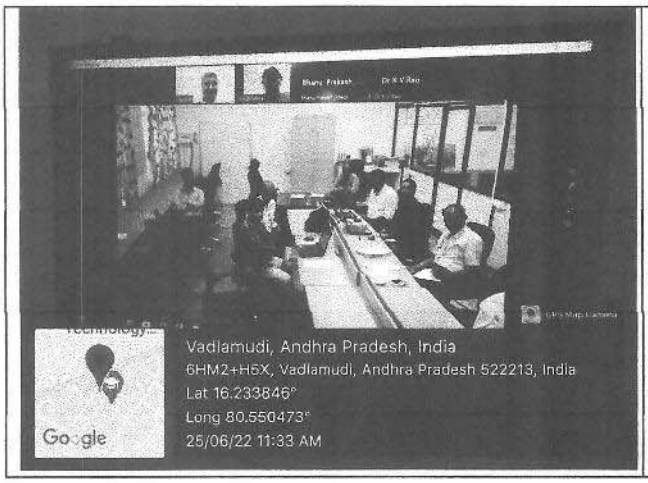
5. The significant changes are made in the content of all courses and hence the courses are considered as new courses provided in Appendix- III.
6. Total average percentage of syllabus revised was 62.9% compared to previous curriculum

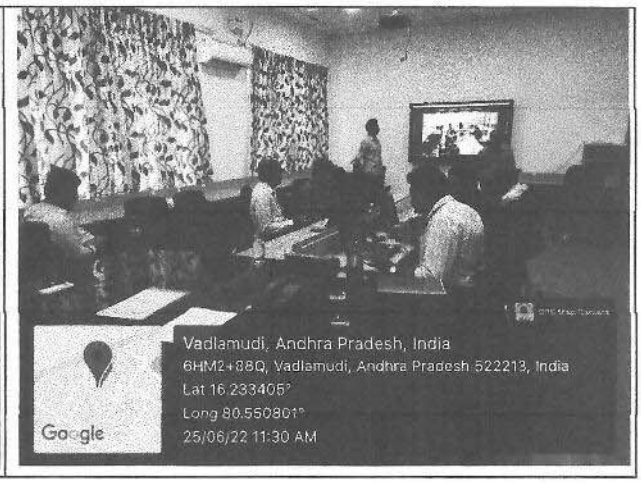
Based on the suggestions given by the members, the Chairperson of BoS told that, those fruitful suggestions would be incorporated appropriately in the curriculum and syllabi of the regulation R22 and this will be recommended to the Academic Council of VFSTR for the approval.

There being no further points for discussion, the Chairperson thanks all the external, internal, invited members and announced that the meeting was adjourned.

Member Secretary

Chairperson





DEPARTMENT OF MECHANICAL ENGINEERING

APPENDIX I

B. Tech in Mechanical Engineering Programme: Curriculum Structure

I Year I Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered by
1.	Linear Algebra and Ordinary Differential Equations	3	2	-	4	Basic Sciences	Mathematics
2.	Engineering Physics	2	-	2	3	Basic Sciences	Physics
3.	Basics of Electrical and Electronics Engineering	2	-	2	3	Basic Engineering	EEE
4.	IT Workshop and Mechanical Engineering Products	1	-	4	3	Basic Engineering	ME
5.	Programming in C	2	-	4	4	Basic Engineering	Training & Placements
6.	English Proficiency and Communication Skills	-	-	2	1	Humanities	English
7.	Physical Fitness, Sports & Games – I	-	-	3	1	Binary grade	Physical Education
8.	Constitution of India	-	2	-	1	Binary grade	Training & Placements
	Total	**10**	**2**	**19**	**20**		
		31 hr					

I Year II Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered by
1.	Partial Differential Equations and Vector Calculus	3	2	-	4	Basic Sciences	Mathematics
2.	Engineering Chemistry	2	-	2	3	Basic science	Chemistry
3.	Engineering Graphics	2	-	2	3	Basic Engineering	ME
4.	Coding Competency (Basic)	-	1	3	2	Basic Engineering	Training & Placements
5.	Technical English Communication	2	-	2	3	Humanities	English
6.	Engineering Mechanics	3	2	-	4	Professional core	ME
7.	Physical Fitness, Sports & Games – II	-	-	3	1	Binary grade	Physical Education
8.	**Orientation Session**	-	-	6	**3**	Binary grade	
	Total	12	5	18	**23**		
		35					

II Year I Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered by
1.	Probability and Statistics	3	2	-	4	Basic Sciences	Statistics
2.	Environmental Studies	1	1	-	1	Basic Sciences	Chemistry
3.	Data Structures	2	2	2	4	Basic Engineering	Training & Placements
4.	Management Science	2	2	-	3	Humanities	Management Studies
5.	Materials Science and Metallurgy	3	-	2	4	Professional core	ME
6.	Strength of Materials	2	2	2	4	Professional core	ME
7.	Engineering Thermodynamics	2	2		3	Professional core	ME
	Life Skills	-	-	2	1	Binary grade	
	Total	15	11	8	**24**		
	NCC/ NSS/ SAC/ E-cell/ Student Mentoring/ Social activities/ Publication with good impact factor (Only 2 students can claim 1 paper /patent). These credits maybe earned on or before the end of IV semester				**1**	Floating credits Binary grade	
	Total	**34**			**25**		

II Year II Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered by
1.	Coding Competency (Advanced)	-	-	2	1	Basic Engineering	Training & Placements
2.	Professional Communication	-	-	2	1	Humanities	Training & Placements
3.	Fluid Mechanics and Hydraulic Machines	2	2	2	4	Professional core	ME
4.	Analysis of Mechanisms and Machines	2	2	2	4	Professional core	ME
5.	Manufacturing Sciences	2	-	2	3	Professional core	ME
6.	Department Elective – 1	2	2		3	Department Elective	ME
7.	Open Elective – 1	2	2		3	Open Elective	
8.	Life Skills	-	-	2	1	Binary grade	
	Total	**10**	**8**	**12**	**20**		
9.	**Minor / Honors – 1**	3	2		**4**		
	Total	**35**			**24**		

III Year I Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered by
1	Soft Skills Lab	-	-	2	1	Humanities	Training & Placements
2	Design of Machine Components	2	2	2	4	Professional core	ME
3	Applied Thermodynamics	2	2	2	4	Professional core	ME
4	Machining Science and Technology	3	-	2	4	Professional core	ME
5	Department Elective – 2	2	2		3	Department Elective	ME
6	Open Elective – 2	2	2		3	Open Elective	
7	Industry interface course (Modular course)	1			1	Binary Grades	ME
	Inter-Departmental Project	-	-	2	-	Project	ME
	Total	12	8	10	**20**		
	NCC/ NSS/ SAC/ E-cell/ Student Mentoring/ Social activities/ Publication with good impact factor (Only 2 students can claim 1 paper /patent). These credits maybe earned on or before the end of VI semester				**1**	Floating credits Binary grade	
8	**Minor / Honors – 2**	3	2		4		
		35			**25**		

III Year II Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered by
1.	Quantitative aptitude & Logical reasoning	1	2	-	2	Humanities	Training & Placements
2.	Finite Element Analysis	2	2	2	4	Professional core	ME
3.	Heat Transfer	2	-	2	3	Professional core	ME
4.	Department Elective – 3	2	2		3	Department Elective	ME
5.	Department Elective – 4	2	2		3	Department Elective	ME
6.	Open Elective – 3	2	2		3	Open Elective	
7.	Inter-Departmental Project/Course	-	-	2	2	Project	
	Total	**14**	**10**	**6**	**20**		
8.	**Minor / Honors – 3**	3	2		**4**		
	Total	17	12	6	**24**		
		35					

IV Year I Semester

Sl. No.	Course Title	L	T	P	C	Remarks	Offered by
1	Operations Research	3	2		4	Professional core	ME
2	Robotics and Automation	3		2	4	Professional core	ME
3	Department Elective – 5	2	2		3	Department Elective	ME
4	Department Elective – 6	2	2		3	Department Elective	ME
5	Department Elective – 7	2	2		3	Department Elective	ME
6	Department Elective – 8	2	2		3	Department Elective	ME
	Total	14	10	2	**20**		
7	**Minor / Honors – 4**	3	2		**4**		
	Total	17	12	4	**24**		
		33					

IV Year II Semester

Sl. No.	Course Title	L	T	P	C	Remarks
1.	Internship / Project Work		2#	22	12	Project
	Total				**12**	
2.	**Minor / Honors – 5**	3	2		**4**	**Theory course may be also offered**
	Total	3	4	22	**16**	

for interaction between Guide and student

List of Department Elective Courses

Basket Name	Name of the course
Course-1	Failure Analysis
Course-2	Biomechanics
Course-3	Tribology
Course-4	Design and Fabrication of Composite Materials
Course-5	Computational Multibody Dynamics
Course-6	Value Engineering
Course-7	Asset Management
Course-8	Design of Smart Actuators
Course-9	Waste Management and Energy Generation Technologies
Course-10	Refrigeration and Air-Conditioning
Course-11	Fuels and Combustion Technology
Course-12	Computational Fluid Dynamics
Course-13	Cryogenics
Course-14	Energy Audit and Management
Course-15	Advanced Engine Technology
Course-16	Jet and Rocket Propulsions
Course-17	3D Printing
Course-18	Automation and Advanced Manufacturing Processes
Course-19	Special Casting and Welding Technologies
Course-20	Digital Manufacturing
Course-21	IOT and Smart Manufacturing
Course-22	Modelling and Simulation of Manufacturing Systems
Course-23	Metrology and Surface Engineering
Course-24	Product Design for Manufacturing
Course-25	Industrial Engineering and Estimating & Costing
Course-26	Industrial Engineering and Production Management
Course-27	Industrial Economics

Course-28	Composite Materials
Course-29	Ceramics, Polymers and Smart Materials
Course-30	Nano material synthesis and Characterization Techniques
Course-31	Environmental Degradation and Bio Materials
Course-32	Electronics and Aerospace Materials
Course-33	Non Destructive Testing
Course-34	Advance Plastic Processing
Course-35	Computational Material Science

List of Open Elective Courses

Basket Name	Stream-1 (Name of the stream)
Course-1	3D Printing
Course-2	Reliability Engineering
Course-3	Operations Research for Engineers

List of Honour/Specialization Courses

Basket Name	Energy Engineering	Automotive Engineering
Course-1	Bio Energy Engineering	Hybrid and Electric Vehicles
Course-2	Hydrogen Energy and Fuel Cells	Automotive Electrical and Electronics
Course-3	Renewable Power Generation Technology	Automotive Safety
Course-4	Solar Energy Engineering	Engine and Vehicle Management System
Course-5	Thermal Storage Systems	Automotive Aerodynamics

List of Minor Courses

Basket Name	Unmanned Aerial Vehicles	Reliability Engineering
Course-1	Basics of UAV's	Fundamentals of Reliability
Course-2	Aerodynamics	Design for Reliability
Course-3	UAV Dynamics And Control	Reliability Estimation and Life Testing
Course-4	Data Acquisition In UAV's	Maintenance Engineering
Course-5	Trouble Shooting Of UAV's	Safety Engineering

Chairperson

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DEPARTMENT OF MECHANICAL ENGINEERING

APPENDIX II

List of Courses that Enables Employability or Entrepreneurship or Skill Development

S. No.	Year and Semester	Course Title	Employability / Entrepreneurship / Skill development
1.	I Year I Semester	Linear Algebra and Ordinary Differential Equations	Skill development
2.	I Year I Semester	Engineering Physics	Skill development
3.	I Year I Semester	Basics of Electrical and Electronics Engineering	Skill development
4.	I Year I Semester	IT Workshop and Mechanical Engineering Products	Skill development
5.	I Year I Semester	Programming in C	Employability
6.	I Year I Semester	English Proficiency and Communication Skills	Skill development
7.	I Year I Semester	Physical Fitness, Sports & Games – I	Skill development
8.	I Year I Semester	Constitution of India	Employability
9.	I Year II Semester	Partial Differential Equations and Vector Calculus	Skill development
10.	I Year II Semester	Engineering Chemistry	Skill development
11.	I Year II Semester	Engineering Graphics	Employability
12.	I Year II Semester	Coding Competency (Basic)	Employability
13.	I Year II Semester	Technical English Communication	Skill development
14.	I Year II Semester	Engineering Mechanics	Skill development
15.	I Year II Semester	Physical Fitness, Sports & Games – II	Skill development
16.	I Year II Semester	**Orientation Session**	Skill development
17.	II Year I Semester	Probability and Statistics	Skill development
18.	II Year I Semester	Environmental Studies	Skill development
19.	II Year I Semester	Data Structures	Employability
20.	II Year I Semester	Management Science	Entrepreneurship
21.	II Year I Semester	Materials Science and Metallurgy	Employability
22.	II Year I Semester	Strength of Materials	Skill development
23.	II Year I Semester	Engineering Thermodynamics	Skill development
24.	II Year I Semester	Life Skills	Skill development
25.	II Year I Semester	NCC/ NSS/ SAC/ E-cell/ Student Mentoring/ Social activities/ Publication	Skill development
26.	II Year II Semester	Coding Competency (Advanced)	Employability
27.	II Year II Semester	Professional Communication	Employability
28.	II Year II Semester	Fluid Mechanics and Hydraulic Machines	Skill development
29.	II Year II Semester	Analysis of Mechanisms and Machines	Skill development

30.	II Year II Semester	Manufacturing Sciences	Skill development
31.	II Year II Semester	Life Skills	Skill development
32.	III Year I Semester	Soft Skills Lab	Skill development
33.	III Year I Semester	Design of Machine Components	Skill development
34.	III Year I Semester	Applied Thermodynamics	Skill development
35.	III Year I Semester	Machining Science and Technology	Skill development
36.	III Year I Semester	Industry interface course (Modular course)	Employability
37.	III Year I Semester	Inter-Departmental Project	Skill development
38.	III Year I Semester	NCC/ NSS/ SAC/ E-cell/ Student Mentoring/ Social activities/ Publication	Skill development
39.	III Year II Semester	Quantitative aptitude & Logical reasoning	Employability
40.	III Year II Semester	Finite Element Analysis	Employability
41.	III Year II Semester	Heat Transfer	Skill development
42.	III Year II Semester	Inter-Departmental Project/Course	Skill development
43.	IV Year I Semester	Operations Research	Employability
44.	IV Year I Semester	Robotics and Automation	Skill development
45.	IV Year II Semester	Internship / Project Work	Employability
46.		Failure Analysis	Skill development
47.		Biomechanics	Skill development
48.		Tribology	Employability
49.		Design and Fabrication of Composite Materials	Skill development
50.		Computational Multibody Dynamics	Employability
51.		Value Engineering	Employability
52.		Asset Management	Employability
53.		Design of Smart Actuators	Skill development
54.		Waste Management and Energy Generation Technologies	Skill development
55.		Refrigeration and Air-Conditioning	Skill development
56.		Fuels and Combustion Technology	Skill development
57.		Computational Fluid Dynamics	Skill development
58.		Cryogenics	Skill development
59.		Energy Audit and Management	Skill development
60.		Advanced Engine Technology	Skill development
61.		Jet and Rocket Propulsions	Skill development
62.		3D Printing	Skill development
63.		Automation and Advanced Manufacturing Processes	Skill development
64.		Special Casting and Welding Technologies	Skill development
65.		Digital Manufacturing	Skill development
66.		IOT and Smart Manufacturing	Skill development
67.		Modelling and Simulation of Manufacturing Systems	Skill development

68.		Metrology and Surface Engineering	Skill development
69.		Product Design for Manufacturing	Skill development
70.		Industrial Engineering and Estimating & Costing	Entrepreneurship
71.		Industrial Engineering and Production Management	Entrepreneurship
72.		Industrial Economics	Employability
73.		Composite Materials	Skill development
74.		Ceramics, Polymers and Smart Materials	Skill development
75.		Nano material synthesis and Characterization Techniques	Skill development
76.		Environmental Degradation and Bio Materials	Skill development
77.		Electronics and Aerospace Materials	Skill development
78.		Non Destructive Testing	Skill development
79.		Advance Plastic Processing	Skill development
80.		Computational Material Science	Skill development
81.		3D Printing	Skill development
82.		Reliability Engineering	Employability
83.		Operations Research for Engineers	Employability
84.		Bio Energy Engineering	Skill development
85.		Hydrogen Energy and Fuel Cells	Skill development
86.		Renewable Power Generation Technology	Skill development
87.		Solar Energy Engineering	Skill development
88.		Thermal Storage Systems	Skill development
89.		Hybrid and Electric Vehicles	Skill development
90.		Automotive Electrical and Electronics	Skill development
91.		Automotive Safety	Skill development
92.		Engine and Vehicle Management System	Skill development
93.		Automotive Aerodynamics	Skill development
94.		Basics of UAV's	Skill development
95.		Aerodynamics	Skill development
96.		UAV Dynamics And Control	Skill development
97.		Data Acquisition In UAV's	Employability
98.		Trouble Shooting Of UAV's	Employability
99.		Fundamentals of Reliability	Skill development
100.		Design for Reliability	Skill development
101.		Reliability Estimation and Life Testing	Employability
102.		Maintenance Engineering	Employability
103.		Safety Engineering	Employability

Chairperson

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DEPARTMENT OF MECHANICAL ENGINEERING

APPENDIX III

List of New Courses in the R22 Curriculum

S. No.	Year and Semester	Course Title	Employability / Entrepreneurship / Skill development
1.	I Year I Semester	Linear Algebra and Ordinary Differential Equations	Skill development
2.	I Year I Semester	Engineering Physics	Skill development
3.	I Year I Semester	Basics of Electrical and Electronics Engineering	Skill development
4.	I Year I Semester	IT Workshop and Mechanical Engineering Products	Skill development
5.	I Year I Semester	Programming in C	Employability
6.	I Year I Semester	English Proficiency and Communication Skills	Skill development
7.	I Year I Semester	Physical Fitness, Sports & Games – I	Skill development
8.	I Year I Semester	Constitution of India	Employability
9.	I Year II Semester	Partial Differential Equations and Vector Calculus	Skill development
10.	I Year II Semester	Engineering Chemistry	Skill development
11.	I Year II Semester	Engineering Graphics	Employability
12.	I Year II Semester	Coding Competency (Basic)	Employability
13.	I Year II Semester	Technical English Communication	Skill development
14.	I Year II Semester	Engineering Mechanics	Skill development
15.	I Year II Semester	Physical Fitness, Sports & Games – II	Skill development
16.	I Year II Semester	**Orientation Session**	Skill development
17.	II Year I Semester	Probability and Statistics	Skill development
18.	II Year I Semester	Environmental Studies	Skill development
19.	II Year I Semester	Data Structures	Employability
20.	II Year I Semester	Management Science	Entrepreneurship
21.	II Year I Semester	Materials Science and Metallurgy	Employability
22.	II Year I Semester	Strength of Materials	Skill development
23.	II Year I Semester	Engineering Thermodynamics	Skill development
24.	II Year I Semester	Life Skills	Skill development
25.	II Year I Semester	NCC/ NSS/ SAC/ E-cell/ Student Mentoring/ Social activities/ Publication	Skill development
26.	II Year II Semester	Coding Competency (Advanced)	Employability
27.	II Year II Semester	Professional Communication	Employability
28.	II Year II Semester	Fluid Mechanics and Hydraulic Machines	Skill development
29.	II Year II Semester	Analysis of Mechanisms and Machines	Skill development

30.	II Year II Semester	Manufacturing Sciences	Skill development
31.	II Year II Semester	Life Skills	Skill development
32.	III Year I Semester	Soft Skills Lab	Skill development
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35.	III Year I Semester	Machining Science and Technology	Skill development
36.	III Year I Semester	Industry interface course (Modular course)	Employability
37.	III Year I Semester	Inter-Departmental Project	Skill development
38.	III Year I Semester	NCC/ NSS/ SAC/ E-cell/ Student Mentoring/ Social activities/ Publication	Skill development
39.	III Year II Semester	Quantitative aptitude & Logical reasoning	Employability
40.	III Year II Semester	Finite Element Analysis	Employability
41.	III Year II Semester	Heat Transfer	Skill development
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64.		Special Casting and Welding Technologies	Skill development
65.		Digital Manufacturing	Skill development
66.		IOT and Smart Manufacturing	Skill development
67.		Modelling and Simulation of Manufacturing Systems	Skill development

68.		Metrology and Surface Engineering	Skill development
69.		Product Design for Manufacturing	Skill development
70.		Industrial Engineering and Estimating & Costing	Entrepreneurship
71.		Industrial Engineering and Production Management	Entrepreneurship
72.		Industrial Economics	Employability
73.		Composite Materials	Skill development
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94.		Basics of UAV's	Skill development
95.		Aerodynamics	Skill development
96.		UAV Dynamics And Control	Skill development
97.		Data Acquisition In UAV's	Employability
98.		Trouble Shooting Of UAV's	Employability
99.		Fundamentals of Reliability	Skill development
100.		Design for Reliability	Skill development
101.		Reliability Estimation and Life Testing	Employability
102.		Maintenance Engineering	Employability
103.		Safety Engineering	Employability

Chairperson