KONGU ENGINEERING COLLEGE, PERUNDURAI - 638 060

MINUTES OF THE MEETING OF BOARD OF STUDIES IN MECHATRONICS ENGINEERING

MEETING No. 24

DATE : 13.08.2022

TIME : 10.00 AM Physical

The following members were present for the meeting:

Dr.B. Meenakshipriya Professor and Head, Mechatronics Engineering, Kongu Engineering College, Perundurai, Erode – 638 060.		Chairman
1.	**Dr. Megalingam @ Murugan A** Associate Professor, Department of Mechatronics Engineering, Bannari Amman Institute of Technology, Alathukombai Post, Sathyamangalam, Erode - 638 401. Tamilnadu. India. E-Mail: megalingama@bitsathy.ac.in Mobile: 98846 46847	University Nominee
2.	**Dr.N. Rajasekar** Professor, Department of Energy and Power Electronics, School of Electrical Engineering, Vellore Institute of Technology, Vellore Campus, Tiruvalam Rd, Katpadi, Vellore, Tamil Nadu – 632014. India. E-Mail: nrajasekar@vit.ac.in Mobile: 99523 62301	Academic Council Nominee
3.	**Mr. Harish Nachnani,** National Sales Manager, Festo India Pvt. Ltd. 237 B, Hosur Road, Bommasandra Industrial Area Bangalore - 560 099. India. E-Mail: harish.nachnani@festo.com Mobile: 99000 39633	Industry Representative
4.	**Dr.K. Krishnamurthy** Professor, Mechatronics Engineering, Kongu Engineering College, Perundurai, Erode – 638 060.	Internal Member
5.	**Dr.S. Shankar** Professor, Mechatronics Engineering, Kongu Engineering College, Perundurai, Erode – 638 060.	Internal Member
6.	**Dr.C. Maheswari** Associate Professor, Mechatronics Engineering, Kongu Engineering College, Perundurai, Erode – 638 060.	Internal Member
7.	**Dr.P. Ravichandran** Associate Professor, Mechatronics Engineering, Kongu Engineering College, Perundurai, Erode – 638 060.	Internal Member
8.	**Dr.S. Sathiyavathi** Associate Professor, Mechatronics Engineering, Kongu Engineering College, Perundurai, Erode – 638 060.	Internal Member
9.	**Dr.K. Gomathi** Associate Professor, Mechatronics Engineering, Kongu Engineering College, Perundurai, Erode – 638 060.	Internal Member
10.	**Dr.V.G. Pratheep** Associate Professor, Mechatronics Engineering, Kongu Engineering College, Perundurai, Erode – 638 060.	Internal Member

11.	Dr.S. Praveen Kumar Assistant Professor SRG, Mechatronics Engineering, Kongu Engineering College, Perundurai, Erode – 638 060.	Internal Member
12.	Dr. K. Suganeswaran. Assistant Professor SRG, Mechatronics Engineering, Kongu Engineering College, Perundurai, Erode – 638 060.	Internal Member
13.	A. Balaji Assistant Professor SRG, Mechatronics Engineering, Kongu Engineering College, Perundurai, Erode – 638 060.	Internal Member
14.	S. Thangavel Assistant Professor SRG, Mechatronics Engineering, Kongu Engineering College, Perundurai, Erode – 638 060.	Internal Member
15.	Dr.E. B. Priyanka Assistant Professor SRG, Mechatronics Engineering, Kongu Engineering College, Perundurai, Erode – 638 060.	Special Invitee

The following members were present as special invitees: Nil

The following members have requested for leave of absence:

1.	Dr. Santhakumar Mohan Associate Professor, Mechanical Engineering, Indian Institute of Technology, Palakkad, Ahalia Integrated Campus, Kozhippara P.O., Palakkad, Kerala – 678557. India. E-Mail: santhakumar@iitpkd.ac.in Mobile: 86029 72799	Academic Council Nominee
2.	Mr.K. Srivatsa Technical Lead - CAE, TATA Technologies Pvt. Ltd. 25, Rajiv Gandhi Infotech Park, Hinjewadi, Pune - 411057.India. E-Mail: vatsa41@gmail.com Mobile: 88846 71449	Alumni Representative

Meeting of the Mechatronics Board:

Chairman/BoS welcomed the members and briefed on curriculum from 1st semester to final semester under Regulations 2022, syllabi of courses from 1st semester to 4th semester under Regulation 2022 and courses to be added / modified under R2020/R2018 for B.E. Mechatronics Engineering Programme.

The board discussed and approved the following points as per the agenda:

Reporting Item No. 24.1: Review of Action Taken Report on previous BoS Meeting minutes as given in Annexure- I

The board members reviewed the Action Taken Report on previous BoS Meeting minutes as given in Annexure- I

Item No. 24.2: Approval of Vision, Mission, PEOs, POs, PSOs of UG/PG Programme as given in Annexure – II.

It is resolved and approved the Vision, Mission, PEOs, POs, PSOs of UG/PG Programme as given in Annexure – II.

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Item No. 24.3: Ratification of the following items under R2018 & R2020 as given in Annexure - III.

a. Course and Syllabi for PhD Course work

-NIL-

b. One / Two credit courses

-NIL-

c. On line courses

- Physics of Renewable Energy Systems
- Integrated Waste Management for A Smart City
- Introduction to Robotics
- Demystifying Networking
- Data Base Management System
- Programming In Java
- Municipal Solid Waste Management
- C Programming and Assembly Language
- Refrigeration and Air-Conditioning
- Advances in Welding and Joining Technologies
- Innovation by Design
- Programming in Modern C++
- Foundations of Cognitive Robotics
- Data Structure and Algorithms Using Java
- Training of Trainers
- Big Data Computing
- Laser Based Manufacturing
- Plastic Waste Management
- Solar Energy Engineering and Technology
- Ecology and Environment
- Wastewater Treatment and Recycling
- Foundations of R Software
- Introduction to Machine Learning (Tamil)
- Introduction To Industry 4.0 And Industrial Internet Of Things
- Human Resource Development
- Aircraft propulsion

d. Curriculum and Syllabi amendments under R2018 / R2020 for UG / PG courses

-NIL-

e. Introduction of new electives under R2018 / R2020 for UG / PG courses

-NIL-

f. Credit transfer from Foreign Universities, Change of Regulations for readmitted students, Transferred candidates

-NIL-

g. Assessment and Evaluation Pattern for specific courses (if any) (such as Design Thinking, Programming Courses, Foreign Languages, NCC, etc)

-NIL-

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h. Other items if any

-NIL-

It is resolved to ratify the above items a, b, c, d, e, f, g and h as given in Annexure – III.

Item No. 24.4: Approval of changes in curriculum from 3rd semester to final semester under R2020 and the syllabi for the modified courses for the students admitted in the academic year 2021-22 as given in Annexure – IV.

The members discussed and approved the changes in curriculum from 3rd semester to final semester under R2020 and the syllabi for the modified courses for the students admitted in the academic year 2021-22 as given in Annexure – IV.

Item No. 24.5. Approval of curriculum from 1st semester to final semester under R2022 and syllabi of courses from 1st semester to 4th semester under Regulation 2022 as given in Annexure-V.

The members discussed and approved the curriculum from 1st semester to final semester under R2022 and syllabi of courses from 1st semester to 4th semester under Regulation 2022 for B.E. Mechatronics Engineering Programme as given in Annexure-V.

Item No. 24.6. Approval of Value-Added Courses (one / two credit courses), on-line courses, Transfer of credits from UGC & AICTE approved institutions and Credit transfer from foreign universities (if any) under R2018 / R2020 / R2022 from the year 2022-23 onwards as given in Annexure-VI.

The members discussed and approved the value added courses (one/ two credit courses), on-line courses with syllabi to be offered from first semester onwards, Transfer of credits from UGC and AICTE approved institutions including NPTEL, SWAYAM, etc., and Credit transfer from foreign universities (if any) under R2018 / R2020 / R2022 from the year 2022-23 onwards as given in Annexure –VI.

Item No. 24.7. Approval of Syllabus for PhD courses under R2022 as given in Annexure - VII.

-Nil-

Ratification Item No. 24.8. As per the direction from Anna University, Chennai, the changes incorporated in the regulations 2020 for all UG & PG students admitted in the academic year 2021-22 with effect from 2021-22 odd semester as given in Annexure - VIII.

The members ratified the changes incorporated in the regulations 2020 for all UG & PG students admitted in the academic year 2021-22 with effect from 2021-22 odd semester as given in Annexure - VIII.

Ratification Item No. 24.9. Assessment and Evaluation Pattern is to be followed for all UG and PG programmes under R2018 and R2020 with effect from 2022-23 odd semester as given in Annexure – IX.

The members ratified the Assessment and Evaluation Pattern is to be followed for all UG and PG programmes under R2018 and R2020 with effect from 2022-23 odd semester as given in Annexure – IX.

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The meeting was concluded with a vote of thanks to the members.

Name & Signature Dr. Megalingam @ Murugan A	Name & Signature Dr.N. Rajasekar
Name & Signature Mr. Harish Nachnani	Name & Signature Dr.K. Krishnamurthy
Name & Signature Dr.S. Shankar	Name & Signature Dr.C. Maheswari
Name & Signature Dr.P. Ravichandran	Name & Signature Dr.S. Sathiyavathi
Name & Signature Dr.K. Gomathi	Name & Signature Dr.V.G. Pratheep
Name & Signature Dr.S. Praveen Kumar	Name & Signature Dr. K. Suganeswaran
Name & Signature A. Balaji	Name & Signature S. Thangavel
Name & Signature Dr.E. B. Priyanka	Name & Signature Chairman/BoS

Dr B.MEENAKSHIPRIYA
PROFESSOR AND HEAD
DEPT OF MECHATRONICS ENGINEERING
KONGU ENGINEERING COLLEGE
THOP' PALAYAM Po)
PERUNDURAI (TK). ERUDE - 638 060

Review of Action Taken Report on previous BoS Meeting minutes

Item No.	Approved/ Ratified Item	Action Taken
2022.23.2	20CSC41 – Data Structures using C	Implemented w.e.f. 2021-22

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Approval of Vision, Mission, PEOs, POs, PSOs of UG/PG Programme

Department of Mechatronics Engineering

Vision

To be a centre of excellence for development and dissemination of knowledge in Mechatronics Engineering for the Nation and beyond

Mission

Department of Mechatronics Engineering is committed to:

1. Disseminate knowledge through effective teaching-learning process to develop ethical Mechatronics professionals to meet the real-world challenges
2. Foster continuous interdisciplinary learning and research by nurturing innovation and providing state-of-the-art facilities
3. Collaborate with Industries and R&D organizations to promote training and social-related consultancy services

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

Graduates of Mechatronics Engineering will:

- Utilize the fundamental knowledge of basic sciences and engineering to succeed as technically competent in their profession

- Design and develop Mechatronics Engineering based products and processes for real world applications

- Exhibit professional and managerial capabilities with ethical conduct and have an aptitude for continuous learning

PROGRAMME OUTCOMES (POs)

Graduates of Mechatronics Engineering will:

1. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

Graduates of Mechatronics Engineering will:

1. Design and develop Mechatronic systems by synergistic combination of mechanical engineering, electronic controls and systems.

2. Adapt multidisciplinary approach to solve real world problems.

Ratification items under R2018 & R2020 implemented during the academic year 2021-22 and/or previous years.

a. Course and Syllabi for PhD Course work

-NIL-

b. One / Two credit courses

-NIL-

c. On line courses

- Physics of Renewable Energy Systems
- Integrated Waste Management for A Smart City
- Introduction to Robotics
- Demystifying Networking
- Data Base Management System
- Programming In Java
- Municipal Solid Waste Management
- C Programming and Assembly Language
- Refrigeration and Air-Conditioning
- Advances in Welding and Joining Technologies
- Innovation by Design
- Programming in Modern C++
- Foundations of Cognitive Robotics
- Data Structure and Algorithms Using Java
- Training of Trainers
- Big Data Computing
- Laser Based Manufacturing
- Plastic Waste Management
- Solar Energy Engineering And Technology
- Ecology and Environment
- Wastewater Treatment and Recycling
- Foundations of R Software
- Introduction to Machine Learning (Tamil)
- Introduction To Industry 4.0 And Industrial Internet Of Things
- Human Resource Development
- Aircraft propulsion

d. Curriculum and Syllabi amendments under R2018 / R2020 for UG / PG courses

-NIL-

e. Introduction of new electives under R2018 / R2020 for UG / PG courses

-NIL-

f. Credit transfer from Foreign Universities, Change of Regulations for readmitted students, Transferred candidates

-NIL-

g. Assessment and Evaluation Pattern for specific courses (if any) (such as Design Thinking, Programming Courses, Foreign Languages, NCC, etc)

-NIL-

h. Other items if any

-NIL-

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Changes in curriculum from 3rd semester to final semester under R2020 and the syllabi for the modified courses for the students admitted in the academic year 2021-22

- 20CSC41 Data Structures using C was introduced as Engineering Science Course in III Semester (R2020) in place of Python Programming for the academic year 2022-23

SEMESTER – I

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			Category
		L	T	P		CA	ESE	Total	
Theory/Theory with Practical									
20EGT11	English Language Skills	3	0	0	3	40	60	100	HS
20MAC11	Matrices and Differential Equations	3	1	2	4	40	60	100	BS
20PHT11	Applied Physics	3	0	0	3	40	60	100	BS
20CYT11	Applied Chemistry	3	0	0	3	40	60	100	BS
20MTT11	Engineering Mechanics	3	1	0	4	40	60	100	PC
20MEC11	Engineering Graphics	2	0	2	3	40	60	100	ES
Practical / Employability Enhancement									
20MEL11	Engineering Practices Laboratory	0	0	2	1	60	40	100	ES
20PHL11	Applied Physics and Chemistry Laboratory	0	0	2	1	60	40	100	BS
20VEC11	Yoga and Values for Holistic Development	--	--	--	1	60	40	100	HS
Mandatory Non Credit									
	Induction Training Program				0	100	0	100	MC
Total Credits to be earned					23				

SEMESTER – II

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			Catego
		L	T	P		CA	ESE	Total	
Theory/Theory with Practical									
20EGT21	Advanced Communication Skills	3	0	0	3	40	60	100	HS
20MAC21	Multivariable Calculus and Complex Analysis	3	1	2	4	40	60	100	BS
20PHT22	Materials Science and Metallurgy	3	0	0	3	40	60	100	BS
20CYT22	Chemistry for Mechanical Systems	3	0	0	3	40	60	100	BS
20MTT21/ 20CSC31	Fluid Mechanics and Thermodynamics / Programming in C for 2021-22 Batch	3	1/0	0/2	4	40	60	100	PC/ES
20MTT22	Electron Devices and Digital Circuits	3	0	0	3	40	60	100	ES
Practical / Employability Enhancement									
20MTL21	Electron Devices and Digital Circuits Laboratory	0	0	2	1	60	40	100	ES
20PHL22	Physics and Chemistry Laboratory II	0	0	2	1	60	40	100	BS
Mandatory Non Credit									
	Nil								
Total Credits to be earned					22				

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SEMESTER – III

Course Code	Course Title	Hours / Week L	T	P	Credit	Maximum Marks CA	ESE	Total	Category
Theory/Theory with Practical									
20CSC31 / 20CSC41	Programming in C for 2020-21 / Data Structures Using C for 2021-22 Batch	3	0	2	4	40	60	100	ES
20MAT31	Probability and Partial Differential Equations	3	0	2	4	40	60	100	BS
20MTT31	Kinematics of Machines	3	1	0	4	40	60	100	ES
20MTT32	Systems and Control Engineering	3	0	0	3	40	60	100	PC
20MTT33	Electrical Machines	3	0	0	3	40	60	100	PC
20MTT34	Manufacturing Processes	3	0	0	3	40	60	100	PC
Practical / Employability Enhancement									
20MTL31	Electrical Machines and Control Laboratory	0	0	2	1	60	40	100	PC
20MTL32	Manufacturing Processes Laboratory	0	0	2	1	60	40	100	PC
Mandatory Non Credit									
20MNT31	Environmental Science	2	0	0	0	100	0	100	MC
Total Credits to be earned					23				

SEMESTER – IV

Course Code	Course Title	Hours / Week L	T	P	Credit	Maximum Marks CA	ESE	Total	Category
Theory/Theory with Practical									
20CSC41 / 20MTT21	Python Programming for 2020-21 / Fluid Mechanics and Thermodynamics for 2021-22	3	0/1	2/0	4	40	60	100	ES/PC
20MAT41	Statistics and Numerical Methods	3	1	0	4	40	60	100	BS
20MTT41	Machine Dynamics	3	1	0	4	40	60	100	PC
20MTT42	Sensors and Signal Conditioning	3	0	0	3	40	60	100	PC
	Open Elective 1(Python Programming for 2021-22)	3	1/0	0/2	4	40	60	100	OE
Practical / Employability Enhancement									
20MTL41	Sensors and Signal Conditioning Laboratory	0	0	2	1	60	40	100	PC
20MTL42	Computer Aided Drafting Laboratory	0	0	2	1	60	40	100	PC
20EGL31	English for work place communication	0	0	2	1	60	40	100	HS
20GEL41	Professional Skills Training I / Industrial Training I -		-	-	2	60	40	100	HS
Mandatory Non Credit									
	Nil								
Total Credits to be earned					24				

SEMESTER – V

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			Catego
		L	T	P		CA	ESE	Total	
Theory/Theory with Practical									
20MTT51	CNC and Metrology	3	0	0	3	40	60	100	PC
20MTT52	Microcontroller Programming and Applications	3	0	0	3	40	60	100	PC
20MTT53	Strength of Materials	3	1	0	4	40	60	100	PC
	Professional Elective 1	3	0	0	3	40	60	100	PE
	Open Elective 2 (DS using C for 2020-21, Java /Web for 21-22)	3	1/0	0/2	4	40	60	100	OE
Practical / Employability Enhancement									
20MTL51	CNC and Metrology Laboratory	0	0	2	1	60	40	100	PC
20MTL52	Microcontroller Programming and Applications Laboratory	0	0	2	1	60	40	100	PC
20MTL53	Computer Aided Engineering Laboratory	0	0	2	1	60	40	100	PC
20GEL51	Professional Skills Training II / Industrial Training II	--	--	--	2	60	40	100	EC
Total Credits to be earned					22				

SEMESTER – VI

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			Cat
		L	T	P		CA	ESE	Total	
Theory/Theory with Practical									
20MTT61	Programmable Automation Controllers	3	0	0	3	40	60	100	PC
20MTT62	Mechanics of Serial Manipulator	3	0	0	3	40	60	100	PC
20MTT63	Fluid Power Systems	3	0	0	3	40	60	100	PC
	Open Elective 3 (Java / Web for 2020-21)	3	0	0	3	40	60	100	OE
Practical / Employability Enhancement									
20MTL61	Programmable Automation Controllers Laboratory	0	0	2	1	60	40	100	PC
20MTL62	Robotics and Control Laboratory	0	0	2	1	60	40	100	PC
20MTL63	Fluid Power Systems Laboratory	0	0	2	1	60	40	100	PC
20GET61	Universal Human Values	--	--	--	2	100	0	100	EC
20MTP61	Project Work 1 Phase I @	0	0	4	2	50	50	100	EC
20GEP71	Comprehensive Test / Viva				2	100	0	100	EC
Mandatory Non Credit									
	Nil								
Total Credits to be earned					21				

SEMESTER – VII

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			Categ
		L	T	P		CA	ESE	Total	
Theory/Theory with Practical									
20GET71	Economics and Management for Engineers	3	0	0	3	40	60	100	HS
20MTT71	Machine Vision and Image Processing	3	0	0	3	40	60	100	PC
	Professional Elective 2	3	0	0	3	40	60	100	PE
	Professional Elective 3	3	0	0	3	40	60	100	PE
	Professional Elective 4	3	0	0	3	40	60	100	PE
	Professional Elective 5	3	0	0	3	40	60	100	OE
Practical / Employability Enhancement									
20MTP71	Project Work 1 Phase II $	0	0	6	3	50	50	100	EC
Mandatory Non Credit									
	Nil								
Total Credits to be earned					21				

SEMESTER – VIII

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			Categ
		L	T	P		CA	ESE	Total	
Theory/Theory with Practical									
	Professional Elective 6	3	0	0	3	40	60	100	PE
	Open Elective 4	3	0	0	3	40	60	100	OE
Practical / Employability Enhancement									
20MTP81	Internship / Project work 2 #	0	0	14	7	50	50	100	EC
Mandatory Non Credit									
	Nil								
Total Credits to be earned					13				

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a. Curriculum from 1st semester to final semester and syllabi of courses from 1st semester to 4th semester under Regulation 2022 for UG / PG Programme

Semester I:

Sl. No	Course Code	Course Title	Hours/Week			Credit	Maximum Marks		
			L	T	P		CA	ESE	Total
1.1	HS	English 1	3	0	0	3	40	60	100
1.2	BS	Mathematics 1	3	0	2	4	40	60	100
1.3	BS	Physics*	3	0	0	3	40	60	100
1.4	PC	Engineering Mechanics	3	0	0	3	40	60	100
1.5	ES	Problem Solving and Programming in C	3	0	2	4	40	60	100
1.6	ES	Engineering Graphics *	2	0	2	3	40	60	100
1.7	ES	Engineering Practices Lab*	0	0	2	1	60	40	100
1.8	BS	Physics Lab*	0	0	2	1	60	40	100
1.9	HS	Yoga and Values for Holistic Education *	--	--	--	1	100	0	100
1.10	MC	Student Induction Program #	---	---	---	0	100	0	100
		Total				23			

Semester II:

Sl. No	Course Code	Course Title	Hours/Week			Credit	Maximum Ma		
			L	T	P		CA	ESE	T
2.1	HS	English 2	3	0	0	3	40	60	1
2.2	BS	Mathematics 2	3	0	2	4	40	60	1
2.3	BS	Chemistry*	3	0	0	3	40	60	1
2.4	PC	Fluid Mechanics and Thermodynamics	3	1	0	4	40	60	1
2.5	ES	Data Structures Using C	3	0	2	4	40	60	
2.6	ES	Electron Devices and Digital Circuits	3	0	0	3	40	60	
2.7	ES	Electron Devices and Digital Circuits Laboratory	0	0	2	1	60	40	
2.8	BS	Chemistry Lab*	0	0	2	1	60	40	
		Total				23			

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Semester III:

Sl. No	Course Code	Course Title	Hours/Week			Credit	Maximum Marks		
			L	T	P		CA	ESE	Total
3.1	BS	Mathematics 3	3	1	0	4	40	60	100
3.2	ES	Java Programming	3	0	2	4	40	60	100
3.3	PC	Theory of Machines	3	1	0	4	40	60	100
3.4	PC	Systems and Control Engineering	3	0	0	3	40	60	100
3.5	PC	Electrical Machines	3	0	0	3	40	60	100
3.6	PC	Electrical Machines and Control Laboratory	0	0	2	1	60	40	100
3.7	PC	Computer Aided Drafting Laboratory	0	0	2	1	60	40	100
3.8	MC	Environmental Science *	2	0	0	0	100	0	100
3.9	HS	English for Work Place Communication *	0	0	2	1	60	40	100
		Total				21			

Semester IV:

Sl. No	Course Code	Course Title	Hours/Week			Credit	Maximum Marks		
			L	T	P		CA	ESE	Total
4.1	ES	Python Programming	3	0	2	4	40	60	100
4.2	PC	Strength of Materials	3	1	0	4	40	60	100
4.3	PC	Computer-Aided Design and Analysis	3	0	2	4	40	60	100
4.4	PC	Sensors and Signal Conditioning	3	0	0	3	40	60	100
4.5	PC	Manufacturing Processes	3	0	0	3	40	60	100
4.6	PC	Sensors and Signal Conditioning Laboratory	0	0	2	1	60	40	100
4.7	PC	Manufacturing Processes Laboratory	0	0	2	1	60	40	100
4.8	EC	Professional Skills Training I	--	--	--	2	100	0	100
		Total				21			

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Semester V:

Sl. No	Course Code	Course Title	Hours/Week			Credit	Maximum Marks		
			L	T	P		CA	ESE	Total
5.1	PC	Fluid Power Systems	2	0	2	3	40	60	100
5.2	PC	CNC and Metrology	3	0	0	3	40	60	100
5.3	PC	Microcontroller Programming and Applications	3	0	0	3	40	60	100
5.4	PC	Power Electronics and Drives	3	0	2	4	40	60	100
5.5	PE	PE 1	3	0	0	3	40	60	100
5.6	OE	OE 1 (Advanced Java Programming/Web Technology – mandatory for all circuit branches)	3	0/1	2/0	4	40	60	100
5.7	PC	CNC and Metrology Laboratory	0	0	2	1	60	40	100
5.8	PC	Microcontroller Programming and Applications Laboratory	0	0	2	1	60	40	100
5.9	EC	Professional Skills Training II	--	--	--	2	100	0	100
					Total	24			

Semester VI:

Sl. No	Course Code	Course Title	Hours/Week			Credit	Maximum Marks		
			L	T	P		CA	ESE	Tot
6.1	PC	Programmable Automation Controllers	3	0	0	3	40	60	10
6.2	PC	Mechanics of Serial Manipulator	3	0	0	3	40	60	10
6.3	PE	PE 2	3	0	0	3	40	60	10
6.4	OE	OE2 (Web Technology-optional)	3	1/0	0/2	4	40	60	10
6.5	PC	Programmable Automation Controllers Laboratory	0	0	2	1	60	40	10
6.6	PC	Robotics and Control Laboratory	0	0	2	1	60	40	10
6.7	EC	Project Work I #	0	0	4	2	100	0	1

6.8	HS / MC	Universal Human Values *	2	0	0	2	100	0	100
6.9	EC	Comprehensive Test and Viva	---	---	---	2	100	0	100
		Total				21	*		

Semester VII:

| Sl. No | Course Code | Course Title | Hours/Week | | | Credit | Maximum Marks | | |
			L	T	P		CA	ESE	Total
7.1	HS	Engineering Economics and Management	3	0	0	3	40	60	100
7.2	PE	PE 3	3	0	0	3	40	60	100
7.3	PE	PE 4	3	0	0	3	40	60	100
7.4	PE	PE5	3	0	0	3	40	60	100
7.5	OE	OE3	3	0	0	3	40	60	100
7.6	EC	Project Work II Phase I	0	0	8	4	50	50	100
		Total				19			

Semester VIII:

| Sl. No | Course Code | Course Title | Hours/Week | | | Credit | Maximum Marks | | |
			L	T	P		CA	ESE	Total
8.1	PE	PE6	3	0	0	3	40	60	100
8.2	OE	OE4	3	0	0	3	40	60	100
8.3	EC	Project Work II Phase II	---	---	14	7	50	50	100
		Total				13			

Professional Electives:

Course Code	Course Name	L	T	P	C	Sem	Domain /Stream
	Elective 1						
	Design of Mechanical Elements	3	0	0	3	V	PD
	Heat and Mass Transfer	3	0	0	3	V	PD
	Operations Research	3	0	0	3	V	PS
	Graphical System Design	3	0	0	3	V	AE
	Introduction to Industrial Internet	3	0	0	3	V	AE

	of Things					
	Advanced Control Theory	3	0	0	3	V	AS
	Elective 2					
	Automotive Engineering	3	0	0	3	VI	PD
	Machine Drawing	3	0	0	3	VI	PD
	Precision Equipment Design	3	0	0	3	VI	PS
	Computer Integrated Manufacturing	3	0	0	3	VI	PS
	Embedded Programming for Mechatronics	3	0	0	3	VI	AE
	Machine Learning	3	0	0	3	VI	AS
	Elective 3					
	Fundamentals of Research	3	0	0	3	VII	GE
	Precision Manufacturing	3	0	0	3	VII	PS
	Machine Vision and Image Processing	3	0	0	3	VII	AE
	Process Control and Instrumentation	3	0	0	3	VII	AE
	Cyber Physical Systems	3	0	0	3	VII	AE
	Optimal and Adaptive Control	3	0	0	3	VII	AS
	Elective 4					
	Applied Finite Element Method	3	0	0	3	VII	PD
	Machine Tool Control and Condition Monitoring	3	0	0	3	VII	PS
	Additive Manufacturing	3	0	0	3	VII	PS
	Battery Management System	3	0	0	3	VII	PS
	Industrial Automation Protocols	3	0	0	3	VII	AE
	Robot Programming	3	0	0	3	VII	AS
	Elective 5					
	Total Quality Management	3	0	0	3	VII	GE
	MEMS & NEMS	3	0	0	3	VII	PD
	Maintenance Engineering	3	0	0	3	VII	PS
	Automotive Electronics	3	0	0	3	VII	AE
	Mobile Robotics	3	0	0	3	VII	AS
	Drone Technology	3	0	0	3	VII	AS
	Elective 6					
	Product Design and Development	3	0	0	3	VIII	PD
	Electric and Hybrid Vehicles	3	0	0	3	VIII	PD

	Production Management	3	0	0	3	VIII	PS
	Digital Twin and Industry 5.0	3	0	0	3	VIII	AE
	Agricultural Robotics and Automation	3	0	0	3	VIII	AE
	Aircraft Mechatronics	3	0	0	3	VIII	AS
	Total Credits to be earned				18		

Open Elective:

	LIST OF OPEN ELECTIVES TO OTHER DEPARTMENTS					
Course Code	**Course Title**	**Hours/Week**			**Credit**	**CBS**
		L	**T**	**P**		
	SEMESTER V					
	Design of Mechatronics Systems	3	1	0	4	OE
	Innovation and Business Model Development	3	1	0	4	OE
	SEMESTER VI					
	Factory Automation	3	0	2	4	OE
	Data Acquisition and Virtual Instrumentation	3	0	2	4	OE
	Entrepreneurship Development	3	0	0	3	OE
	SEMESTER VII					
	3D Printing and Design	3	0	0	3	OE
	Drone System Technology	3	0	0	3	OE
	SEMESTER VIII					
	Robotics	3	0	0	3	OE
	Virtual and Augment Reality in Industry 4.0	3	0	0	3	OE

b. **Syllabi of courses from 1st semester to 4th semester of UG/PG Programme under R2022**

   -Nil-

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c. Syllabi of the courses to be added / modified under R2018 / R2020 for B.E. Mechatronics Engineering Programmes

(a) List of courses newly added:

S.No.	Course Name	Semester	Regulation
1.	Data Structures using C	III	R2020

(b) List of courses modified the syllabus content:

S.No.	Course Code & Course Name	Semester	Regulation
	Nil		

(c) List of courses removed:

S.No.	Course Code & Course Name	Semester	Regulation
	Nil		

(d) List of courses swapped:

S.No.	Course Code(s) & Course Name(s)	Existing Semester	Swapped Semester	Regulation
	Professional Skills Training I	V	IV	R2020
	Professional Skills Training II	VI	V	R2020
	Universal Human Values	IV	VI	R2020

Syllabi for the courses mentioned in above items (a) and (b) under R2018 / R2020

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List and Syllabi of One / Two credit courses, on-line courses and syllabi, Transfer of credits from UGC and AICTE approved institutions and credit transfer from Foreign Universities (if any) under R2018 / R2020 / R2022 (from the year 2022-23 onwards)

List of One/Two Credit Courses to be Offered:

- LabVIEW - Core I and Core II Programming
- Maintenance and Troubleshooting of CNC Machines
- Machine Tool Monitoring using MT-Link
- Programming using ALLEN BRADLEY PLC's
- Relay Logic Controller
- IOT application development and device control
- Circuit Simulation using ORCAD-Pspice
- Design of Printed Circuit Boards
- Fabrication of Printed Circuit Boards
- IoT Programming using Node MCU-ESP8266
- Robot Operating System
- Operations and Programming for Humanoid Robot
- Robot Operations and Programming
- Solid Modelling and Assembly using Solid Works
- Embedded IOT and Communication Protocols

International Certification Courses to be Offered:

- Certified LabVIEW Associate Developer (CLAD)
- Certified LabVIEW Developer (CLD)
- Certified Solid Works Associate (CSWA)
- Certified Solid Works Professional (CSWP)
- FANUC certification courses on Robot Programming and CNC Simulator

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Annexure – VII

Syllabi for PhD courses under R2022

-Nil-

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REPORTING ITEM 24.8

As per the direction from Anna University, Chennai, the changes have been incorporated in the regulations 2020 for all UG & PG students admitted in the academic year 2021-22 with effect from 2021-22 odd semester as given in Annexure - V.

I. Weightage of Marks for Continuous Assessment Test and End Semester Examination

a. Theory course: 40% Continuous Assessment + 60 % End Semester Examination

b. Theory cum Practical course: 50% Continuous Assessment + 50% End Semester Examination

c. Practical course: 60% Continuous Assessment + 40% End Semester Examination

d. Project Work: 50% Continuous Assessment + 50% End Semester Examination

II. Passing Requirements for all PG programmes:

A candidate who secures not less than 50 % of total marks (continuous assessment and end semester examination put together) prescribed for the course with a **minimum of 45 %** of the marks prescribed for the end semester examination in all category of courses except for the courses which are evaluated based on continuous assessment only shall be declared to have successfully passed the course in the examination.

III. Award of Letter Grades:

The award of letter grades will be decided based on **relative grading principle**. For those students who have passed the course, the relative grading shall be done.

Marks/Examination Status	Letter Grade	Grade Point
Based on Relative Grading	O (Outstanding)	10
	A+ (Excellent)	9
	A (Very Good)	8
	B+ (Good)	7
	B (Average)	6
	C (Satisfactory)	5
Less than 50 marks	U (Re-appearance)	0
Successfully Completed	SC	0
Withdrawal	W	-
Absent	AB	-
Shortage of Attendance in a course	SA	-

III. Classification of the Degree Awarded:

CGPA required for First class 6.50 (instead of 7.0).

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REPORTING ITEM 24.6

Assessment and Evaluation Pattern is to be followed for all UG and PG programmes under R2018 and R2020 with effect from 2022-23 odd semester

I. Continuous Assessment Test (for all programmes under R2018 & R2020):

- Two tests for 2 hours and a maximum of 60 marks each and minimum marks for pass : 30 marks
- One test per day. No classes in the remaining hours of the day.
- Question Pattern for Continuous Assessment Test

CAT	Continuous Assessment Test - I			Continuous Assessment Test - II		
Questions will be taken from	Unit I	Unit II	Unit III	Unit III	Unit IV	Unit V
PART A (10 * 2 marks = 20 marks)	4	4	2	2	4	4
PART B (4 * 10 marks = 50 marks) 1 from each + 1 from any	1	1	1	1	1	1

II. Marks Split-up for Continuous Assessment for the students admitted in 2019-20 & 2020-21 under R2018 & R2020:

S. No	Description	Credit Distribution			
		Theory	Theory cum Practical		
		3 T/ 3T+1(Tutorial)	2T + 1P	3T + 1 P	3.5 T + 0.5 P
THEORY COMPONENT					
1	**Continuous Assessment Test**	CAT I - 15 Marks CAT II - 15 Marks Total: 30 Marks	CAT I - 7.5 Marks CAT II - 7.5 Marks Total: 15 Marks	CAT I - 9 Marks CAT II - 9 Marks Total: 18 Marks	CAT I -15 Marks CAT II – 15 Mark Total: 30 Marks
2	**Tutorial** Tutorial/Problem Solving (or) Simulation (or) Simulation & Mini Project (or) Mini Project (or) Case Studies (or) Any other relevant to the course	15 Marks	5 Marks	7 Marks	10 Marks
3	**Student Activity Points (SAP):** (as already circulated)	3 Marks	-	-	-
4	**Student Personality Development (SPD):** Seminar – 2 per student - 25 marks GD/ Debate - 4 per student - 25 marks Role play /Marketing – 2 per student - 25 marks News Reading/ Others - 2 per student - 25 marks **Total: 100 Marks – Converted to 2 Marks**	2 Marks	-	-	-
PRACTICAL COMPONENT					
1	Continuous Assessment for Experiments	-	15	10	10
2	Assessment Test	-	15	15	-
	CONTINUOUS ASSESSMENT MARKS	50	50	50	50
	END SEMESTER EXAMINATION	50	50	50	50
	TOTAL	100 Marks	100 Marks	100 Marks	100 Marks

(P.T.O)

III. Marks Split-up for Continuous Assessment for the students admitted in 2021-22 under R2020:

S. No	Description	Credit Distribution			
		Theory	Theory cum Practical		
		3 T/ 3T+1(Tutorial)	2T + 1P	3T + 1 P	3.5 T + 0.5 P
THEORY COMPONENT:					
1	Continuous Assessment Test	CAT I - 12.5Marks CAT II- 12.5Marks Total: 25 Marks	CAT I - 7.5 Marks CAT II -7.5 Marks Total: 15 Marks	CAT I - 9 Marks CAT II - 9 Marks Total: 18 Marks	CAT I -15 Marks CAT II- 15 Marks Total: 30 Marks
2	Tutorial: Tutorial/Problem Solving (or) Simulation (or) Simulation & Mini Project (or) Mini Project (or) Case Studies (or) Any other relevant to the course	10 Marks	5 Marks	7 Marks	10 Marks
3	Student Activity Points (SAP): (as already circulated)	3 Marks	-	-	-
4	Student Personality Development (SPD): Seminar – 2 per student - 25 marks GD/ Debate - 4 per student - 25 marks Role play /Marketing – 2 per student　　　- 25 marks News Reading/ Others - 2 per student　 - 25 marks Total: 100 Marks – Converted to 2 Marks	2 Marks	-	-	-
PRACTICAL COMPONENT:					
1	Continuous Assessment for Experiments	-	15	10	10
2	Assessment Test	-	15	15	-
	CONTINUOUS ASSESSMENT MARKS	40	50	50	50
	END SEMESTER EXAMINATION	60	50	50	50
	TOTAL	100 Marks	100 Marks	100 Marks	100 marks

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