



# KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE

Opp : Yerragattu Gutta, Hasanparthy (Mandal), WARANGAL - 506 015, Telangana, INDIA.

काकतीय प्रौद्योगिकी एवं विज्ञान संस्थान, वरंगल - ५०६ ०१५ तेलंगाना, भारत

కాకతీయ సాంకేతిక విజ్ఞాన శాస్త్ర విద్యాలయం, వరంగల్ - ౫౦౬ ౦౧౫ తెలంగాణ, భారతదేశము

(An Autonomous Institute under Kakatiya University, Warangal)

(Approved by AICTE, New Delhi; Recognised by UGC under 2(f) & 12(B); Sponsored by EKASILA EDUCATION SOCIETY)

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### PG – M.Tech. (POWER ELECTRONICS)

PRR -20

## SCHEME OF INSTRUCTION & EVALUTION

(I Semester to IV Semester)

(Applicable from the Academic Year 2020-21)



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### VISION OF THE INSTITUTE

- To make our students technologically superior and ethically strong by providing quality education with the help of our dedicated faculty and staff and thus improve the quality of human life

### MISSION OF THE INSTITUTE

- To provide latest technical knowledge, analytical and practical skills, managerial competence and interactive abilities to students, so that their employability is enhanced
- To provide a strong human resource base for catering to the changing needs of the Industry and Commerce
- To inculcate a sense of brotherhood and national integrity

## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### VISION OF THE DEPARTMENT

- To fulfill the needs of the industry and society through excellence in education and research in electrical engineering

### MISSION OF THE DEPARTMENT

- To produce globally competent engineers in Electrical and Electronics Engineering
- To promote scientific inclination and cultivate professional ethics
- To serve organization and society as adaptable engineers, entrepreneurs, or leaders

<b>PROGRAM EDUCATIONAL OBJECTIVES (PEOs)</b>	
<b>PG - M.Tech. (POWER ELECTRONICS)</b>	
<b>PROGRAM EDUCATIONAL OBJECTIVES (PEOs)</b>	The postgraduates of <b>POWER ELECTRONICS</b> will be able to
<b>PEO1 (Research and Innovation)</b>	<i>engage in research, innovation and teaching in the fields related to power electronics &amp; drives</i>
<b>PEO2 (Technical expertise and Successful career)</b>	<i>excel in professional practices relevant to industry and engage in entrepreneurship with latest technologies in the areas of power converters, renewable energy, smart electric grid, industrial drives and electric vehicles</i>
<b>PEO3 (Soft skills and Lifelong learning)</b>	<i>exhibit professional ethics, effective communication skills and spirit of teamwork by carrying out research for a sustainable development</i>

<b>PROGRAM OUTCOMES (POs) &amp; PROGRAM SPECIFIC OUTCOMES (PSOs)</b>	
<b>PG - M.Tech. (POWER ELECTRONICS)</b>	
<b>PROGRAM OUTCOMES (POs)</b>	<b>At the time of graduation,</b> the postgraduates of <b>POWER ELECTRONICS</b> will be able to ...
<b>PO1</b>	<i>independently carry out research /investigation and development work to solve practical problems</i>
<b>PO2</b>	<i>write and present an effective technical report/document</i>
<b>PO3</b>	<i>demonstrate competence in the area of power electronics</i>
<b>PROGRAM SPECIFIC OUTCOMES (PSOs):</b>	
<b>PSO1</b>	<i>apply knowledge of power electronics for the development of effective and innovative solutions to problems pertaining to the renewable energy sources, smart electric grids and electric vehicles</i>
<b>PSO2</b>	<i>analyze complex engineering problems related to power electronics industry and develop solutions with the latest hardware and software tools</i>



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PRR-20

**SCHEME OF INSTRUCTION & EVALUATION FOR TWO YEAR POSTGRADUATE PROGRAMME**

**M.Tech. (POWER ELECTRONICS)**

**SEMESTER-I**

S. No.	Course Category	Course Code	Course Title	Hours per Week			Credits	Evaluation Scheme								
				CIE - TA									ESE	Total Marks		
				I <sup>2</sup> RE				Minor	MSE	Total						
				ATLP	CRP	CP					PPT					
1	PC	P20PE101	Analysis of Power Electronic Converters	3	-	-	3	8	8	8	6	10	20	60	40	100
2	PC	P20PE102	Renewable Energy Systems	3	-	-	3	8	8	8	6	10	20	60	40	100
3	PE	P20PE103	Professional Elective-I/ MOOC-I	3	-	-	3	8	8	8	6	10	20	60	40	100
4	PE	P20PE104	Professional Elective-II/ MOOC-II	3	-	-	3	8	8	8	6	10	20	60	40	100
5	PC	P20PE105	Power Converters Laboratory	-	-	4	2	-	-	-	-	-	-	60	40	100
6	PC	P20PE106	Renewable Energy Systems Laboratory	-	-	4	2	-	-	-	-	-	-	60	40	100
7	MC	P20MC107	Research Methodology & IPR	2	-	-	2	8	8	8	6	10	20	60	40	100
8	AC	P20AC108	Audit Course-I	2	-	-	1	8	8	8	6	10	20	60	40	100
<b>Total</b>				<b>16</b>	<b>-</b>	<b>8</b>	<b>19</b>	<b>480</b>						<b>320</b>	<b>800</b>	

Note:

1. *Additional Learning: Students are advised to do MOOCs to bridge the gap in the curriculum, as suggested by the Department Academic Advisory Committee (DAAC). The credits earned by the student through MOOCs will be printed in the semester grade sheet.*

**[L= Lecture, T = Tutorials, P = Practicals, C = Credits, ATLP = Assignments, CRP = Course Research Paper, CP = Course Patent, PPT = Course Presentation, Minor=Minor Examination, MSE=Mid Semester Examination and ESE=End Semester Examination]**

<b><u>Professional Elective-I/ MOOCs-I</u></b>		<b><u>Professional Elective-II/ MOOCs-II</u></b>		<b><u>Audit Course-I</u></b>	
P20PE103A:	Electrical Machine Modeling and Analysis	P20PE104A:	Nonlinear Control Systems	P20PE108A:	English for Research Paper Writing
P20PE103B:	FACTS & Custom Power Devices	P20PE104B:	Microgrid & Distributed Generation Technologies	P20AC108B:	Sanskrit for Technical Knowledge
P20PE103C:	Electromagnetic Interference & Compatibility	P20PE104C:	Power Quality	P20AC108C:	Constitution of India
P20PE103D:	MOOCs	P20PE104D:	MOOCs	P20AC108D:	Pedagogy Studies

**Total Contact Periods/Week: 24**

**Total Credits: 19**



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**M.Tech. (POWER ELECTRONICS)**

PRR-20

**SEMESTER-II**

S. No.	Course Category	Course Code	Course Title	Hours per Week			Credits	Evaluation Scheme								
				L	T	P		CIE - TA						ESE	Total Marks	
								I <sup>2</sup> RE				Minor	MSE			Total
								ATLP	CRP	CP	PPT					
1	PC	P20PE201	Advanced Power Electronics	3	-	-	3	8	8	8	6	10	20	60	40	100
2	PC	P20PE202	Power Electronic Control of DC & AC Drives	3	-	-	3	8	8	8	6	10	20	60	40	100
3	PE	P20PE203	Professional Elective-III/ MOOC-III	3	-	-	3	8	8	8	6	10	20	60	40	100
4	PE	P20PE204	Professional Elective-IV/ MOOC-IV	3	-	-	3	8	8	8	6	10	20	60	40	100
5	PC	P20PE205	Advanced Power Electronics Simulation Laboratory	-	-	4	2	-	-	-	-	-	-	60	40	100
6	PC	P20PE206	Electric Drives Laboratory	-	-	4	2	-	-	-	-	-	-	60	40	100
7	PROJ	P20PE207	Mini Project with Seminar	-	-	4	2	-	-	-	-	-	-	100	-	100
8	AC	P20AC208	Audit Course-II	2	-	-	1	8	8	8	6	10	20	60	40	100
<b>Total</b>				<b>14</b>	<b>-</b>	<b>12</b>	<b>19</b>							<b>520</b>	<b>280</b>	<b>800</b>

Note:

1. The students shall undergo mandatory Industrial training/ Internship for at least 6 to 8 weeks during summer vacation at Industry/R&D organization. Internship evaluation will be done during the III semester.
2. Additional Learning: Students are advised to do MOOCs to bridge the gap in the curriculum, as suggested by the Department Academic Advisory Committee (DAAC). The credits earned by the student through MOOCs will be printed in the semester grade sheet.

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<u>Professional Elective-III/ MOOCs-III</u>		<u>Professional Elective-IV/ MOOCs-IV</u>		<u>Audit Course-II</u>	
P20PE203A:	Artificial Intelligence Applications in Power Engineering	P20PE204A:	Electric and Hybrid Electrical Vehicles	P20AC208A:	Stress Management by Yoga
P20PE203B:	Optimal Control Theory	P20PE204B:	Microcontroller & DSP based Systems	P20AC208B:	Value Education
P20PE203C:	Modeling and Simulation of Power Electronic Systems	P20PE204C:	Energy Auditing & Management	P20AC208C:	Personality Development through Life Enlightenment Skills
P20PE203D:	MOOCs	P20PE204D:	MOOCs	P20AC208D:	Disaster Management

**Total Contact Periods/Week: 26**

**Total Credits: 19**



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**M.Tech. (POWER ELECTRONICS)**

**SEMESTER-III**

**PRR-20**

S. No.	Course Category	Course Code	Course Title	Hours per Week			Credits	Evaluation Scheme								
				CIE - TA									ESE	Total Marks		
				PRE				Minor	MSE	Total						
				ATLP	CRP	CP					PPT					
L	T	P														
1	PE	P20PE301	Professional Elective-V/ MOOC-V	3	-	-	3	8	8	8	6	10	30	60	40	100
2	OE	P20OE302	Open Elective-I/ MOOC-VI	3	-	-	3	8	8	8	6	10	30	60	40	100
3	PROJ	P20PE303	Dissertation Phase-I / Industrial Project (to be continued in IV - semester also as Dissertation Phase-II)	-	-	18	9	-	-	-	-	-	-	100	-	100
4	PROJ	P20PE304	Internship Evaluation	-	-	2	-	-	-	-	-	-	-	100	-	100
<b>Total</b>				<b>6</b>	<b>-</b>	<b>20</b>	<b>15</b>							<b>320</b>	<b>120</b>	<b>400</b>

Note:

1. Additional Learning: Students are advised to do MOOCs to bridge the gap in the curriculum, as suggested by the Department Academic Advisory Committee (DAAC). The credits earned by the student through MOOCs will be printed in the semester grade sheet.

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<u>Professional Elective-V/ MOOCs-V</u>		<u>Open Elective-I/ MOOCs-VI</u>	
P20PE301A:	Smart Electric Grid	P20OE302A:	Business Analytics
P20PE301B:	Advanced Control Strategies for Power Converters and Drives	P20OE302B:	Industrial Safety
P20PE301C:	Machine Learning	P20OE302C:	Operations Research
P20PE301D:	MOOCs	P20OE302D:	Cost Management of Engineering Projects
		P20OE302E:	Composite Materials
		P20OE302F:	Waste to Energy
		P20OE302H:	MOOCs

Total Contact Periods/Week: 26

Total Credits: 15



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**SCHEME OF INSTRUCTION & EVALUATION FOR TWO YEAR POSTGRADUATE PROGRAMME**  
**M.Tech. (POWER ELECTRONICS)**  
**SEMESTER-IV**

S. No.	Course Category	Course Code	Course Title	Hours per Week			Credits	Evaluation Scheme								
								CIE - TA				ESE	Total Marks			
				L	T	P		PRE						Minor	MSE	Total
								ATLP	CRP	CP	PPT					
1	PROJ	P20PE401	Dissertation <i>Phase-II</i>	-	-	30	15	-	-	-	-	-	-	60	40	100
<b>Total</b>				-	-	30	15							60	40	100

[L= Lecture, T = Tutorials, P = Practicals, C = Credits, ATLP = Assignments, CRP = Course Research Paper, CP = Course Patent, PPT = Course Presentation, Minor=Minor Examination, MSE=Mid Semester Examination and ESE=End Semester Examination]

**Total Contact Periods/Week: 30**

**Total Credits: 15**

### COURSE CREDIT STRUCTURE COURSE WEIGHTAGE

Semester	PRR-20 Curriculum	As per Model Curriculum
I	19	18
II	19	18
III	15	16
IV	15	16
<b>Total:</b>	<b>68</b>	<b>68</b>

Courses	% Weightage of Courses
Professional Theory	42.85 % (9/21)
Professional Lab	38.1 % (8/21)
Other	19.05 % (4/21)
<b>Total:</b>	<b>100 % (21/21)</b>

### SEMESTER vs COURSE CATEGORY WEIGHTAGE

Number of Courses / Number of Credits (*Course Category wise*)

Semester	MC	PC	PE	OE	PROJ	AC	TOTAL
I	1/2	4/10	2/6	-	-	1/1	<b>8/19</b>
II	-	4/10	2/6	-	1/2	1/1	<b>8/19</b>
III	-	-	1/3	1/3	2/9	-	<b>4/15</b>
IV	-	-	-	-	1/15	-	<b>1/15</b>
<b>Total</b>	<b>1/2</b>	<b>8/20</b>	<b>5/15</b>	<b>1/3</b>	<b>4/26</b>	<b>2/2</b>	<b>21/68</b>
<b>% Weightage of Course Category</b>	<b>2.94 % (2/68)</b>	<b>29.41 % (20/68)</b>	<b>22.05 % (15/68)</b>	<b>4.41 % (3/68)</b>	<b>38.23 % (26/68)</b>	<b>2.94 % (2/68)</b>	<b>100 % (68/68)</b>