K.RAMAKRISHNAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

SAMAYAPURAM, TIRUCHIRAPPALLI-621112

M.E POWER SYSTEMS ENGINEERING

REGULATION – 2020 (FULL TIME)

(CHOICE BASED CREDIT SYSTEM)

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

- **PEO 1:** Have strong foundation in Electrical and Electronics Engineering to excel in professional career, in higher studies or research.
- **PEO 2:** Analyze, design and develop various interdisciplinary projects and products, to solve social issues.
- **PEO 3:** Have professional ethics and effective communication skills with life-long learning attitudes.

PROGRAM OUTCOMES POs:

Engineering Graduates will be able to:

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

2. Problem analysis: 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/development of solutions: 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. Conduct investigations of complex problems: 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. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

6. The engineer and society: 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. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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

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

10. Communication: 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. Project management and finance: 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. Life-long learning: 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 OBJECTIVES (PSOs)

- **PSO1:** Apply the logical, analytical and technical skills to model and build electrical systems and appliances as per societal requirements.
- **PSO2:** Apply the advanced and fundamentals Electrical and allied Engineering knowledge in the design and development of hardware and software tools for non-conventional electrical power generation and distribution.

Mapping of POs/PSOs to PEOs

1. Reasonable 2. Significant 3.Strong

S.No	PO'S	PEO1	PEO2	PEO3
1.	Engineering knowledge	3	3	3
2.	Problem analysis	3	2	2
3.	Design/development of solutions	3	2	2
4.	Conduct investigations of complex problems	2	3	1
5.	Modern tool usage	3	2	1
6.	The engineer and society	2	3	3
7.	Environment and sustainability	2	3	3
8.	Ethics	2	2	3
9.	Individual and team work	2	3	2
10.	Communication	2	2	3
11.	Project management and finance	3	3	2
12.	Life-long learning	3	2	3

	PSO'S	PEO1	PEO2	PEO3
1	To understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, database, big data analytics, and networking for efficient design of computer-based systems of varying complexity.	3	3	3
2	To employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur and leadership qualities.	3	2	2

SEMESTER - I								
S.NO	**COURSE CODE**	**TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY								
1.	PPSMA10	Applied Mathematics for Electrical Engineers	FC	4	4	0	0	4
2.	PPSPC11	Advanced Power System Analysis	PC	4	4	0	0	4
3.	PPSPC12	Power System Operation and Control	PC	3	3	0	0	3
4.	PPSPC13	Analysis and Design of Power Converters	PC	3	3	0	0	3
5.	PPSPEXX	Professional Elective I	PE	3	3	0	0	3
6.	PPSPEXX	Professional Elective II	PE	3	3	0	0	3
PRACTICALS								
7.	PPSPC14	Power System Simulation Laboratory	PC	4	0	0	4	2
			TOTAL	**24**	**20**	**0**	**4**	**22**

SEMESTER - II								
S.NO	**COURSE CODE**	**TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY								
1.	PPSPC21	Power System Dynamics	PC	3	3	0	0	3
2.	PPSPC22	EHVAC and HVDC	PC	3	3	0	0	3
3.	PPSPC23	Power System Protection	PC	3	3	0	0	3
4.	PPSPC24	Restructured Power System	PC	3	3	0	0	3
5.	PPSPEXX	Professional Elective III	PE	3	3	0	0	3
6.	PPSPEXX	Professional Elective IV	PE	3	3	0	0	3
PRACTICALS								
7.	PPSPC25	Advanced Power System Simulation Laboratory	PC	4	0	0	4	2
8.	PPSTS26	Technical Seminar	EEC	2	0	0	2	1
			TOTAL	**24**	**18**	**0**	**6**	**21**

SEMESTER - III								
S.NO	**COURSE CODE**	**TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY								
1.	PPSPC31	Smart Grid	PC	3	3	0	0	3
2.	PPSPEXX	Professional Elective V	PE	3	3	0	0	3
3.	PPSPEXX	Professional Elective VI	PE	3	3	0	0	3
PRACTICALS								
4.	PPSPW31	Project Work Phase I	EEC	12	0	0	12	6
			TOTAL	**21**	**9**	**0**	**12**	**15**

SEMESTER - IV								
S.NO	**COURSE CODE**	**TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
PRACTICALS								
1.	PPSPW41	Project Work Phase II	EEC	24	0	0	24	12
			TOTAL	**24**	**0**	**0**	**24**	**12**

FOUNDATION COURSES								
S.NO	**COURSE CODE**	**TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY								
1.	PPSMA10	Applied Mathematics for Electrical Engineers	FC	4	4	0	0	4

PROFESSIONAL CORE								
S.NO	**COURSE CODE**	**TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
THEORY								
1.	PPSPC11	Advanced Power System Analysis	PC	4	4	0	0	4
2.	PPSPC12	Power System Operation and Control	PC	3	3	0	0	3
3.	PPSPC13	Analysis and Design of Power Converters	PC	3	3	0	0	3
4.	PPSPC14	Power System Simulation Laboratory	PC	4	0	0	4	2
5.	PPSPC21	Power System Dynamics	PC	3	3	0	0	3
6.	PPSPC22	EHVAC and HVDC	PC	3	3	0	0	3
7.	PPSPC23	Power System Protection	PC	3	3	0	0	3
8.	PPSPC24	Restructured Power System	PC	3	3	0	0	3
9.	PPSPC25	Advanced Power System Simulation Laboratory	PC	4	0	0	4	2
10.	PPSPC31	Smart Grid	PC	3	3	0	0	3

EMPLOYABILITY ENHANCEMENT COURSES								
S.NO	**COURSE CODE**	**TITLE**	**CATEGORY**	**CONTACT PERIODS**	**L**	**T**	**P**	**C**
1.	PPSTS26	Technical Seminar	EEC	2	0	0	2	1
2.	PPSPW31	Project Work Phase I	EEC	12	0	0	12	6
3.	PPSPW41	Project Work Phase II	EEC	24	0	0	24	12

PROFESSIONAL ELECTIVE – I (SEMESTER I)								
S.NO	COURSE CODE	COURSE TITLE	CATEGORY	TOTAL CONTACT PERIODS	PERIODS PER WEEK			CREDITS
					L	T	P	
1	PPSPE01	Industrial Power System Analysis and Design	PE	3	3	0	0	3
2	PPSPE02	Analysis and Computation of Electromagnetic Transients in Power Systems	PE	3	3	0	0	3
3	PPSPE03	Flexible AC Transmission Systems	PE	3	3	0	0	3
4	PPSPE04	Power System Reliability	PE	3	3	0	0	3

PROFESSIONAL ELECTIVE – II (SEMESTER I)								
S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	TOTAL CONTACT PERIODS	PERIODS PER WEEK			CREDITS
					L	T	P	
1	PPSPE21	Analysis of Electrical Machines	PE	3	3	0	0	3
2	PPSPE22	Electric Vehicles and Power Management	PE	3	3	0	0	3
3	PPSPE23	Soft Computing Techniques	PE	3	3	0	0	3
4	PPSPE24	Computer Networking	PE	3	3	0	0	3

PROFESSIONAL ELECTIVE – III (SEMESTER II)								
S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	TOTAL CONTACT PERIODS	PERIODS PER WEEK			CREDITS
					L	T	P	
1	PPSPE05	Advanced Power System Dynamics	PE	3	3	0	0	3
2	PPSPE06	Principles of Electric Power Transmission	PE	3	3	0	0	3
3	PPSPE07	State Estimation and Security control of Power System	PE	3	3	0	0	3
4	PPSPE16	Solar and Energy Storage Systems	PE	3	3	0	0	3

PROFESSIONAL ELECTIVE – IV (SEMESTER II)								
S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	TOTAL CONTACT PERIODS	PERIODS PER WEEK			CREDITS
					L	T	P	
1	PPSPE08	Design of Substations	PE	3	3	0	0	3
2	PPSPE09	Power System Automation	PE	3	3	0	0	3
3	PPSPE10	Electrical Distribution System	PE	3	3	0	0	3
4	PPSPE17	Distributed Generation and Micro grid	PE	3	3	0	0	3

PROFESSIONAL ELECTIVE – V (SEMESTER III)								
S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	TOTAL CONTACT PERIODS	PERIODS PER WEEK			CREDITS
					L	T	P	
1	PPSPE11	System Theory	PE	5	3	2	0	4
2	PPSPE12	Control System Design for Power Electronics	PE	3	3	0	0	3
3	PPSPE13	Microcontroller Applications in Power Converters	PE	3	3	0	0	3
4	PPSPE19	Energy Management and Auditing	PE	3	3	0	0	3

PROFESSIONAL ELECTIVE – VI (SEMESTER III)								
S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	TOTAL CONTACT PERIODS	PERIODS PER WEEK			CREDITS
					L	T	P	
1	PPSPE14	Industrial Control Electronics	PE	3	3	0	0	3
2	PPSPE15	Advanced Digital Signal Processing	PE	3	3	0	0	3
3	PPSPE18	Wind Energy Conversion Systems	PE	3	3	0	0	3
4	PPSPE20	Electromagnetic Interference and Compatibility	PE	3	3	0	0	3

SUBJECT CATEGORIZATION					
SEMESTER	**FC**	**PC**	**PE**	**EEC**	**Total Credits**
I	**4**	**12**	**6**		**22**
II		**14**	**6**	**1**	**21**
III		**3**	**6**	**6**	**15**
IV				**12**	**12**
Total Credits	**4**	**29**	**18**	**19**	**70**
% Distribution	**5.72**	**41.43**	**25.71**	**27.14**	**100**