POOJYA DODDAPPA APPA COLLEGE OF ENGINEERING, KALABURAGI
Scheme of Teaching and Examinations – 2024
M.Tech – POWER ELECTRONICS (PEE)
Choice Based Credit System (CBCS) and Outcome-Based Education(OBE)

I SEMESTER

Sl. No	Course	Course Code	Course Title	Teaching Hours per Week			Examination				Credits
				Theory	Practical/Seminar	Tutorial/ Skill Development Activities	Duration in hours	CIE Marks	SEE Marks	Total Marks	
				L	P	T/SDA					
1	BSC/PCC	24PEE11	**Linear Algebra and Probability Theory.**	03	00	00	03	50	50	100	3
2	IPCC/PCC/PBLC	24PEE12	**Power Semiconductor Device & Components**	03	02	00	03	50	50	100	4
3	PCC	24PEE13	**Power Electronics Converters - I**	03	00	02	03	50	50	100	4
4	PCC	24PEE14	**HVDC Power Transmission Systems.**	02	00	02	03	50	50	100	3
5	PCC	24PEE15	**Design of Power Converters.**	02	00	02	03	50	50	100	3
6	PCCL	24PEEL16	**Power Semiconductor Devices Lab.**	01	02	00	03	50	50	100	2
7	PCCL	24PEEL17	**Power Electronics Lab - I**	01	02	00	03	50	50	100	2
8	PCC	**24SEM18**	**Technical Seminar**	00	01	01	03	100	---	100	1
9	NCMC	24RMI19	**Research Methodology and IPR (Online)**	Online courses (online.vtu.ac.in)							PP
				17	**05**	**07**	**24**	**450**	**350**	**800**	**22**

Note: **BSC**-Basic Science Courses, **PCC**: Professional core.**IPCC**-Integrated Professional Core Courses,**NCMC**- None Credit MandatoryCourse, **PCCL**-Professional Core Course lab
AUD/AEC –Audit Course / Ability Enhancement Course, **L-Lecture, P-Practical, T/SDA-Tutorial / Skill Development Activities**(Hours are for Interaction between faculty and students)**PBLC**: Project Based Learning Course

Integrated Professional Core Course (IPCC): Refers to a Professional Theory Core Course Integrated with practicals of the same course. The theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by only CIE (no SEE). However, questions from the practical part of IPCC shall be included in the SEE question paper.

Project Based Learning Course (PBLC): Project Based Learning Courseis a professional core Course only Students have to complete a project out of learning from the course and SEE will be viva voce on project work.

Skill development activities:Under Skill development activities in a concerning course, the students should

1. Interact with industry (small, medium, and large).
2. Involve in research/testing/projects to understand their problems and help creative and innovative methods to solve the problem.
3. Involve in case studies and field visits/ fieldwork.
4. Accustom to the use of standards/codes etc., to narrow the gap between academia and industry.
5. Handle advanced instruments to enhance technical talent.
6. Gain confidence in modeling of systems and algorithms for transient and steady-state operations, thermal study, etc.

7. Work on different software/s (tools) to simulate, analyse and authenticate the output to interpret and conclude.

All activities should enhance student's abilities to employment and/or self-employment opportunities, management skills, Statistical analysis, fiscal expertise, etc.

Students and the course instructor/s to be involved either individually or in groups to interact together to enhance the learning and application skills of the study they have undertaken. The students with the help of the course teacher can take up relevant technical –activities that will enhance their skills. The prepared report shall be evaluated for CIE marks.

24RMI19-Research Methodology and IPR- None Credit Mandatory Course (NCMC) if students have not studied this course in their undergraduate program then he /she has to take this course at **http://online.vtu.ac.in** and qualifying in this course is compulsory before completion of the minimum duration of the program (Two years), however, this course will not be considered for vertical progression.

Technical Seminar: Students have to finalize the technical topic for the seminar in consultation with a faculty mentor, Preparation of the seminar report, and presentation slides to be presented at the end of the semester.

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Sl. No	Course	Course Code	Course Title	Teaching Hours /Week			Examination				Credits
				Theory	Practical/ Seminar	Tutorial/ Skill Development Activities	Duration in hours	CIE Marks	SEE Marks	Total Marks	
				L	P	T/SDA					
1	IPCC/PCC	24PEE21	Electric Drives	02	00	02	03	50	50	100	4
2	PCC/PBLC	24PEE22	Power Electronics Converters - II	02	00	02	03	50	50	100	3
2	PCC	24PEE23	Power Quality Issues and Mitigation.	03	02	00	03	50	50	100	3
3	PEC	24PEE24x	Professional elective 1	02	00	02	03	50	50	100	3
4	PEC	24PEE25x	Professional elective 2	02	00	02	03	50	50	100	3
5	MPS	**24MPS26**	Mini Project/Technology-Based Societal Project	00	04	02	--	100	--	100	3
6	PCCL	24PEEL27	**Power Electronics Lab - II**	01	02	00	03	50	50	100	2
7	AEC/SEC	24PEE28x	Ability/Skill Enhancement Course (Offline/Online)	00	02	---	02	50	50	100	1
				01	00	----	01				
			TOTAL	13	10	10	21	450	350	700	22

Note: **BSC**-Basic Science Courses, **PCC**: Professional core. **IPCC**-Integrated Professional Core Courses, **NCMC**- None Credit Mandatory Course, **PCCL**-Professional Core Course lab
AUD/AEC/SEC–Audit Course / Ability Enhancement Course/Skill Enhancement Course, **L-Lecture, P-Practical, T/SDA-Tutorial / Skill Development Activities** (Hours are for Interaction between faculty and students) **PBLC**: Project Based Learning Course, **MPS**: Mini Project with Seminar/ Societal Project with Seminar

Professional Elective 1		Professional Elective 2	
Course Code under 24XXX24X	Course title	Course Code under 24XXX25X	Course title
24PEE241	Solid State AC Motor Controllers.	24PEE251	Uninterruptible Power Supply.
24PEE242	Hybrid Electric Vehicles.	24PEE252	Digital Power Electronics.
24PEE243	FACTS Controllers.	24PEE253	EMC in Power Electronics.
24PEE244	Cyber Security in the Electric Sector	24PEE254	Internet Based Control Systems.

Ability / Skill Enhancement Courses			
24XXX281			
24XXX282			
24XXX283			
24XXX284			

Note:

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Project Based Learning Course (PBLC): Project Based Learning Courseis a professional core Course only Students have to complete a project out of learning from the course and SEE will be viva voce on project work

1 Mini Project/ Societal with Seminar: This may be hands-on practice**,** survey report, data collection and analysis, coding, mobile app development, field visit and report preparation, modelling of system, simulation, analysing and authenticating, case studies, etc. It may be Techno Societal Project, technical Project work useful for the society.

CIE marks shall be awarded by a committee comprising of HoD as Chairman, Guide/co-guide, if any, and a senior faculty of the department. Students can present the seminar based on the completed mini-project/Societal Project. Participation in the seminar by all postgraduate students of the program shall be mandatory.

The CIE marks awarded for Mini/Societal Project work and Seminar, shall be based on the evaluation of Mini/ Societal Project work and Report, Presentation skill and performance in Question-and-Answer session in the ratio 50:25:25. Mini-Project with Seminar shall be considered as a head of passing and shall be considered for vertical progression as well as for the award of degree. Those, who do not take-up/complete the Mini Project and Seminar shall be declared as fail in that course and have to complete the same during the subsequent semester. **There is no SEE for this course.**

Audit Courses /Ability Enhancement Courses Suggested by BOS (ONLINE courses): Audit Courses: These are prerequisite courses suggested by the concerned Board of Studies. Ability Enhancement Courses will be suggested by the BoS if prerequisite courses are not required for the programs. **Ability Enhancement Courses**:

- These courses are prescribed to help students to enhance their skills in in fields connected to the field of specialisation as well allied fields that leads to employable skills. Involving in learning such courses are impetus to lifelong learning.
- The courses under this category are online courses published in advance and approved by the concerned Board of Studies.
- Registration to Audit /Ability Enhancement Course shall be done in consultation with the mentor and is compulsory during the concerned semester.
- In case a candidate fails to appear for the proctored examination or fails to pass the selected online course, he/she can register and appear for the same course if offered during the next session or register for a new course offered during that session, in consultation with the mentor.
- The Audit Ability Enhancement Course carries no credit and is not counted for vertical progression. However, a pass in such a course is mandatory for the award of the degree.

For the students who are willing to take up a two-semester duration Industry/Research Internship Leading to Project work /start-up

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IIISEMESTER (A)

Sl. No	Course	Course Code	Course Title	Theory L	Practical/ Mini–Project/ Internship P	Tutorial/ Skill Development Activities SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
1	PEC	24PEE31x	Professional Elective 3 (Online Courses)	03	00	00	03	50	50	100	3
2	PEC	24PEE32x	Professional Elective 4 (Online Courses)	03	00	00	03	50	50	100	3
3	INT	**24INT33**	Research Internship /Industry-Internship leading to project work/ Startup	Two-semester duration, SEE in the IV semester which leads to project work /start-up			03	100	---	100	4
4	PROJ	24PROJ34	Project Phase-I				03	100	---	100	2
			TOTAL	**09**	**12**	**03**	**12**	**300**	**100**	**400**	**12**

Note: **PEC**: Professional Elective Courses, **L-Lecture, P-Practical, T/SDA-Tutorial / Skill Development Activities** (Hours are for Interaction between faculty and students). **INT**: Internship: Research Internship / Industry Internship Leading to the project work /start-up, **PROJ: Project Phase-I**: Problem statement out of undergone Internship (Industry /Research) report submission Only CIE.

IV SEMESTER (A)

Sl. No	Course	Course Code	Course Title	Theory L	Practical /Field work P	Duration in hours	CIE Marks	SEE Marks Viva voce	Total Marks	Credits
1	INT	24INT41	Research Internship / Industry Internship Leading to Project Work/Start-up	Two Semester Duration		03	100	100	200	12
2	PROJ	24PRO42	Project Phase-II			03	100	100	200	12
			TOTAL			**06**	**200**	**200**	**400**	**24**

INT: Industry/ Research Internship leading to the project work /startup**PROJ**: Project work outcome of Internship (Project Phase-II is Viva voce SEE)

For the students who are willing to take an Industry Internship for one semester duration and independent project work next semester

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IIISEMESTER (B)

Sl. No	Course	Course Code	Course Title	Teaching Hours /Week			Examination					Credits
				Theory	Practical/ Mini–Project/ Internship	Tutorial/ Skill Development Activities	Duration in hours	CIE Marks	SEE Marks	Total Marks		
				L	P	SDA						
1	PEC	24PEE31x	Professional Elective 3 (Online Course) (12 weeks courses)	03	00	00	03	50	50	100		3
2	PEC	24PEE32x	Professional Elective4 (OnlineCourses) (12-week course)	03	00	00	03	50	50	100		3
3	INT	24INT33	Industry Internship	One semester Duration			03	100	100	200		10
			TOTAL	**06**	**00**	**00**	**09**	**200**	**200**	**400**		**16**

Note: PCC: Professional core courses, PEC: Professional Elective Courses, IPCC-Integrated Professional Core Courses. MPS-Mini Project With Seminar; AUD/AEC; Audit Courses / Ability Enhancement Courses (Mandatory), PCCL-Professional Core Course lab, **L-Lecture, P-Practical, T/SDA-Tutorial / Skill Development Activities** (Hours are for Interaction between faculty and students)

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IV SEMESTER (B)

Sl. No	Course	Course Code	Course Title	Teaching Hours /Week		Examination					Credits
				Theory	Practical/ Field work	Duration in hours	CIE Marks	SEE Marks Viva voce	Total Marks		
				L	P						
1	Project	24PROJ41	Project work	--	08	03	100	100	200		16
2	PEC/OEC	24PEE42	Online courses (16-week course)	04	0	03	50	50	100		04
				04	**08**	**06**	**150**	**150**	**300**		**20**

PROJECT WORK (24PROJ41): The objective of the Project work is

- To encourage independent learning and the innovative attitude of the students.

- To develop an interactive attitude, communication skills, organization, time management, and presentation skills.

- To impart flexibility and adaptability.

- To inspire teamwork.

- To expand intellectual capacity, credibility, judgment, and intuition.

- To adhere to punctuality, setting and meeting deadlines.

- To instill responsibilities to oneself and others.

- To train students to present the topic of project work in a seminar without any fear, face the audience confidently, enhance communication skills, involved in group discussions to present and exchange ideas.

CIE procedure for Project Work:

(1) Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.The CIE marks awarded for the project work, shall be based on the evaluation of the project work Report, project presentation skill, and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

(2) Interdisciplinary: Continuous Internal Evaluation shall be group-wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable. The CIE marks awarded for the project work shall be based on the evaluation of the project work Report, project presentation skill, and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

SEE procedure for Project Work: SEE for project work will be conducted by the two examiners appointed by the University. The SEE marks awarded for the project work shall be based on the evaluation of the project work Report, project presentation skill, and question and answer session in the ratio 50:25:25.

Online Course: These are the MOOC courses that the relevant stream's Board of Studies has recommended; you can access them at www.online.vtu.ac.in. To qualify for those courses, the students must complete 12 to 16-week courses. The courses chosen have not to be the same as that of the coursesor subjects covered in the preceding semesters. Depending on the needs of the degree program, the BoS may recommend interdisciplinary courses. It is required to pass the course and qualify.