



SIDDAGANGA INSTITUTE OF TECHNOLOGY, TUMAKURU

(An autonomous institution affiliated to VTU, Belagavi, Approved by AICTE, New Delhi, Accredited by NAAC with 'A' grade & ISO 9001:2015 Certified)

M.Tech. in Power electronics

SCHEME OF TEACHING AND EXAMINATION (80 Credits Scheme)

Applicable for students admitted from the Academic Year 2022-23 and onwards

I Semester

Sl. No.	Course Type and Course Code		Course Title	Teaching Hours per Week			Examination				Credits
				Theory	Practical / Seminar	Tutorial / Skill Development Activities	Duration in hrs.	CIE Marks	SEE Marks	Total Marks	
				L	P	T/SDA					
1.	BSC	N1PGMAT	Applied Mathematics	3	0	0	3	50	50	100	3
2.	IPCC	N1EPE01	Controlled Rectifiers and Inverters	3	2	0	3	50	50	100	4
3.	PCC	N1EPE02	Modeling and Analysis of Electrical Machines	3	0	2	3	50	50	100	4
4.	PCC	N1EPE03	Switched Mode and Resonant Converters	2	0	2	3	50	50	100	3
5.	PCC	N1EPE04	Advanced Control Systems	2	0	2	3	50	50	100	3
6.	PEC	N1EPEE1x	Professional Elective – 1	2	-	2	3	50	50	100	3
7.	MCC	N1PGRM	Research Methodology and IPR	3	0	0	3	50	50	100	3
8.	PCCL	N1EPEL01	Power Electronics Laboratory – I	1	2	0	3	50	50	100	2
9.	NCMC	NHS07	Soft Skills	36 hrs. during the entire semester				100	---	100	0
10.	AUD/AEC	N1EPEAUD / N1EPEAEC	BoS Recommended online course	Classes and Evaluation Procedures are as per the policy of the online course providers							0
	Total			19	4	8		500	400	900	25
Professional Elective 1											
N1EPEE11		Embedded System Design									
N1EPEE12		Electric Power Quality									
N1EPEE13		Soft Computing									
N1EPEE14		Advanced Digital Signal Processing									



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Note: **BSC**-Basic Science Courses, **IPCC**-Integrated Professional Core Courses, **PCC**: Professional Core Course, **PEC**: Professional Elective Course, **MCC**- Mandatory Credit Course, **PCCL**-Professional Core Course Lab, **NCMC**-Non Credit Mandatory Course
AUD/AEC –Audit Course / Ability Enhancement Course(A pass in AUD/AEC is mandatory for the award of the degree)
L-Lecture, **P**-Practical, **T/SDA**-Tutorial / Skill Development Activities (Hours are for Interaction between faculty and students)

Integrated Professional Core Course (IPCC): Refers to Professional Theory Core Course Integrated with practical 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.

Audit Courses /Ability Enhancement Courses suggested by BoS (ONLINE courses):

Audit Courses 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.

- These courses are prescribed to help students to enhance their skills connected to the field of specialization 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.

Skill development activities: in a concerned course, the students should

- Interact with industry (small, medium, and large).
- Involve in research/testing/projects to understand their problems and help creative and innovative methods to solve the problem.
- Involve in case studies and field visits/ fieldwork.
- Accustom to the use of standards/codes etc., to narrow the gap between academia and industry.
- Handle advanced instruments to enhance technical talent.
- Gain confidence in modelling of systems and algorithms for transient and steady-state operations, thermal study, etc.
- Work on different software to simulate, analyze 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 involve 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 which will enhance their skill. The prepared report shall be evaluated for CIE marks.



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II Semester

Sl. No.	Course Type and Course Code		Course Title	Teaching Hours per Week			Examination				Credits
				Theory	Practical / Seminar	Tutorial / Skill Development Activities	Duration in hrs.	CIE Marks	SEE Marks	Total Marks	
				L	P	T/SDA					
1.	IPCC	N2EPE01	Digital Controllers for Power Electronic applications	3	2	0	3	50	50	100	4
2.	PCC	N2EPE02	Electric Drives	3	0	2	3	50	50	100	4
3.	PCC	N2EPE03	Modeling and Control of Power Electronic Systems	2	0	2	3	50	50	100	3
4.	PEC	N2EPEE2x	Professional Elective – 2	2	0	2	3	50	50	100	3
5.	PEC	N2EPEE3x	Professional Elective – 3	2	0	2	3	50	50	100	3
6.	OEC	N2OE0x	Open Elective	3	0	0	3	50	50	100	3
7.	MPS	N2EPEMPS	Mini Project with Seminar	0	4	2	--	100	--	100	3
8.	PCCL	N2EPEL01	Power Electronics Laboratory – II	1	2	0	3	50	50	100	2
9.	AEC	ARAS	Aptitude Related Analytical Skills	36 Hrs. for the entire semester			2	50	50	100	0
10	AUD/ AEC	N2EPEAUD / N2EPEAEC	BoS Recommended online course	Classes and Evaluation Procedures are as per the policy of the online course providers							0
	Total			16	8	10		500	400	900	25

Note: **IPCC**-Integrated Professional Core Courses, **PCC**: Professional Core Course, **PEC**: Professional Elective Course, **OEC**- Open Elective Course

MPS- Mini Project with Seminar, **PCCL**-Professional Core Course Lab,

AUD/AEC –Audit Course / Ability Enhancement Course (A pass in AUD/AEC is mandatory for the award of the degree)

L-Lecture, **P**-Practical, **T/SDA**-Tutorial / Skill Development Activities (Hours are for Interaction between faculty and students)

Professional Elective 2			Professional Elective 3		Open Elective 1	
N2EPEE21	PWM converters and applications	N2EPEE31	HVDC and FACTS	N2OE01	Nano science and nano technology	
N2EPEE22	Distributed generation and microgrids	N2EPEE32	Hybrid Electric Vehicles			
N2EPEE23	Electro Magnetic Compatibility	N2EPEE33	Special Electrical Machines			
N2EPEE24	Design of Power Electronic Converters	N2EPEE34	Power Electronics in Smart Grid/ Distributed Generation and Microgrids			



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- 1. Mini Project 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.

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. Participation in the seminar by all postgraduate students of the program shall be mandatory.

The CIE marks awarded for Mini-Project work and Seminar, shall be based on the evaluation of Mini 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.**
- 2. Internship:** All the students shall have to undergo a mandatory internship of **06 weeks** during the vacation of II and III semesters. A University examination shall be conducted during III semester and the prescribed internship credit shall be counted in the same semester. The internship 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 internship shall be declared as fail in the internship course and have to complete the same during the subsequent University examination after satisfying the internship requirements.



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III Semester

Sl. No.	Course Type and Course Code		Course Title	Teaching Hours per Week			Examination				Credits
				Theory	Practical / Seminar	Tutorial / Skill Development Activities	Duration in hrs.	CIE Marks	SEE Marks	Total Marks	
				L	P	T/SDA					
1.	PROJ	N3EPEPR	Project Work Phase – 1	0	6	0	--	100	--	100	3
2.	SP	N3EPESP	Societal Project	0	6	0	--	100	--	100	3
3.	INT	N3EPEINT	Internship	(06 weeks Internship completed during the intervening vacation of II and III semesters)			3	50	50	100	6
	Total			0	12	0		250	50	300	12

Note: **PROJ**-Project Work Phase-1, **SP** –Societal Project, **INT**-Internship

L-Lecture, **P**-Practical, **T/SDA**-Tutorial / Skill Development Activities (Hours are for Interaction between faculty and students)

- Project Work Phase-1:** The project work shall be carried out individually. However, in case a disciplinary or interdisciplinary project requires more participants, then a group consisting of not more than three shall be permitted.
 Students in consultation with the guide/co-guide (if any) in disciplinary project or guides/co-guides (if any) of all departments in case of multidisciplinary projects, shall pursue a literature survey and complete the preliminary requirements of the selected Project work. Each student shall prepare a relevant introductory project document, and present a seminar.
 CIE marks shall be awarded by a committee comprising of HoD as Chairman, all Guide/s and co-guide/s (if any) and a senior faculty of the concerned departments. The CIE marks awarded for project work phase -1, shall be based on the evaluation of Project Report, Project Presentation skill, and performance in the Question and Answer session in the ratio of 50:25:25. **There is no SEE for this course.**
- Societal Project:** Students in consultation with the internal guide as well as with external guide (much preferable) shall involve in applying technology to workout/proposing viable solutions for societal problems.
 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. The CIE marks awarded, shall be based on the evaluation of Project Report, Project Presentation skill, and performance in the Question and Answer session in the ratio of 50:25:25.
 Those, who have not pursued /completed the Societal Project, shall be declared as fail in the course and have to complete the same during subsequent semester/s after satisfying the Societal Project requirements. **There is no SEE for this course.**
- Internship:** Those, who have not pursued /completed the internship, shall be declared as fail in the internship course and have to complete the same during subsequent University examinations after satisfying the internship requirements. Internship SEE (University examination) shall be as per the University norms.
 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. The CIE marks awarded for project work phase -1, shall be based on the evaluation of Project Report, Project Presentation skill, and performance in the Question and Answer session in the ratio of 50:25:25.



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IV Semester

Sl. No.	Course Type and Course Code		Course Title	Teaching Hours per Week			Examination				Credits
				Theory	Practical / Field work	Tutorial / Skill Development Activities	Duration in hrs.	CIE Marks	SEE Marks	Total Marks	
				L	P	T/SDA					
1.	PROJ	N4EPEPR	Project Work Phase – 2	0	8	0	3	100	100	100	18
	Total			0	8	0		100	100	100	18

Note: **PROJ**-Project Work Phase-2

L-Lecture, **P**-Practical, **T/SDA**-Tutorial / Skill Development Activities (Hours are for Interaction between faculty and students)

1. Project Work Phase-2: Students in consultation with the guide/co-guide (if any) in disciplinary project or guides/co-guides (if any) of all departments in case of multidisciplinary projects, shall continue to work of Project Work phase -1 to complete the Project work. Each student / batch of students shall prepare project document, and present a seminar.

CIE marks shall be awarded by a committee comprising of HoD as Chairman, all Guide/s and co-guide/s (if any) and a senior faculty of the concerned departments. The CIE marks awarded for project work phase -2, shall be based on the evaluation of Project Report, Project Presentation skill, and performance in the Question and Answer session in the ratio of 50:25:25.

SEE shall be at the end of IV semester. Project work evaluation and Viva-Voce examination (SEE), after satisfying the plagiarism check, shall be as per the Institute norms.