

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
M.TECH IN ELECTRONICS & COMMUNICATION (VLSI DESIGN)

Scheme of Teaching and Examinations2022

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2022-23)

I SEMESTER

Sl. No	Course	Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination			Credits	
					Theory Lecture	Tutorial	Practica I/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks		Total Marks
					L	T	P	S					
1	BSC	22MATEE11	Advanced Engineering Mathematics	TD:-Mathematics	03	00	00	-	03	50	50	100	3
2	IPCC	22LVL12	VLSI Design with Verilog	TD:-ECE	03	00	02	-	03	50	50	100	4
3	PCC	22LVL13	Advanced Embedded Systems	TD:-ECE	03	00	00	-	03	50	50	100	3
4	PCC	22LVL14	VLSI Testing	TD:-ECE	03	00	00	-	03	50	50	100	3
5	PCC	22LVL15	ASIC Design	TD:-ECE	03	00	00	-	03	50	50	100	3
6	MCC	22RMI16	Research Methodology and IPR	Humanities	03	00	00	Y	03	50	50	100	3
7	PCCL	22LVSL17	VLSI Design Lab-1	TD:-ECE	01	00	02		03	50	50	100	2
8	AUD/AEC	22AUD18/	BOS recommended ONLINE courses	If the course is a Theory				01	50	50	100	1	
				1	0	0							
				If a course is a laboratory				02					
				0	0	2							
Total					17/18	00	04/06	00	22/24	400	400	800	22

PCC: Professional Core Course, **PCCL:** Professional Core Course laboratory, **MC:** Mandatory Course (Non-credit), **AEC:** Ability Enhancement Course, **SEC:** Skill Enhancement Course, **L:** Lecture, **T:** Tutorial, **P:** Practical **S= SDA:** Skill Development Activity, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Evaluation.K : This letter in the course code indicates common to all the stream of engineering. **ESC:** Engineering Science Course, **ETC:** Emerging Technology Course, **PLC:** Programming Language Course

Professional Core Course (IPCC): Refers to Professional Core Course Theory Integrated with practical of the same course. Credit for IPCC can be 04 and its Teaching– Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). 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. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-22 may please be referred.

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II SEMESTER

Sl. No	Course and Course Code		Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical / Drawing	Self -Study	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	PCC	22LVL21	VLSI Processing Technology	TD:-ECE	02	02	00	00	03	50	50	100	3
2	IPCC	22LVL22	Design of Analog and Mixed Mode VLSI Circuits	TD:-ECE	03	00	02	00	03	50	50	100	4
3	PEC	22LVL23X	Professional Elective 1	TD:-ECE	02	02	00	00	03	50	50	100	3
4	PEC	22LVL24X	Professional Elective 2	TD:-ECE	02	02	00	00	03	50	50	100	3
5	MPS	22LVL25	Mini Project with Seminar	TD:-ECE	00	02	04	Y	--	100	00	100	3
6	PCCL	22LVLL26	VLSI Design Lab-2	TD:-ECE	01	00	02	00	03	50	50	100	02
7	AUD/AEC	22AUD27	Suggested ONLINE courses	TD:-ECE	If the course is Theory				01	50	50	100	PP
					1	0	0						
					If the course is a lab				02				
					0	0	2						
Total					10/11	08	08/10	00	16/17	400	300	700	18

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)

Professional Elective1			Professional Elective 2		
22LVL231	AdvancesinVLSIDesign		22LVL241	LowPowerVLSIDesign	
22LVL232	Nano-electronics		22LVL242	SoCDesign	
22LVL233	StaticTimingAnalysis		22LVL243	SystemVerilog	

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.

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III SEMESTER

Sl. No	Course and Course Code		Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practical / Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	PCC	22LVL31	CAD of Digital Systems	TD:-ECE	03	02	00	00	3	50	50	100	4
2	PEC	22LVL32X	Professional Elective 3	TD:-ECE	03	00	00	00	3	50	50	100	3
3	PEC	22LVL33X	Professional Elective 4	TD:-ECE	03	00	00	00	3	50	50	100	3
4	PROJ	22LVL34	Project Work Phase -1	TD:-ECE	00	00	06	Y	3	100	00	100	3
5	SP	22LVL35	Societal Project	TD:-ECE	00	00	06	00	3	100	00	100	3
6	INT	22LVL36	Internship	TD:-ECE	(06 weeks Internship Completed during the intervening vacation of II and III semesters.)				03	50	50	100	6
Total					09	02	12		18	400	200	600	22

Professional Elective Course

22LVL321	Fin FETs and Other Multi-Gate Transistors	22LVL331	Reconfigurable Computing
22LVL322	VLSI Design for Signal Processing	22LVL332	Long Term Reliability of VLSI Systems
22LVL323	Advances in Image Processing	22LVL333	CMOSRF Circuit Design

PCC: Professional Core Course, **PCCL:** Professional Core Course laboratory, **UHV:** Universal Human Value Course, **MC:** Mandatory Course (Non-credit), **AEC:** Ability Enhancement Course, **SEC:** Skill Enhancement Course, **L:** Lecture, **T:** Tutorial, **P:** Practical **S= SDA:** Skill Development Activity, **CIE:** Continuous Internal Evaluation, **SXX:** Semester End Evaluation. **K :** The letter in the course code indicates common to all the stream of engineering. **PROJ:** Project /Mini Project. **PEC:** Professional Elective Course. **SP:** Societal Project.

Professional Core Course (IPCC): Refers to Professional Core Course Theory Integrated with practicals of the same course. Credit for IPCC can be 04 and its Teaching– Learning hours (L : T : P) can be considered as (3 : 0 : 2) or (2 : 2 : 2). 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. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-22

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.

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 (University examination) 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.

Professional Elective Courses (PEC): A professional elective (PEC) course is intended to enhance the depth and breadth of educational experience in the Engineering and Technology curriculum. Multidisciplinary courses that are added supplement the latest trend and advanced technology in the selected stream of engineering. Each group will provide an option to select one course. The minimum number of students' strengths for offering a professional elective is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.

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IV SEMESTER

Sl. No	Course and Course Code		Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					Theory Lecture	Tutorial	Practica I/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	HSMC	22LVL41	Project work phase -2	ECE	00	00	08	Y	03	100	100	200	18
Total					00	00	08	Y	03	100	100	200	18

Project 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 -1to 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 University norms.