

MVJ College of Engineering, Whitefield, Bangalore 560067

An Autonomous Institution, Affiliated to VTU, Belagavi

Scheme of Teaching and Examination

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

Effective from the academic year 2023-24

Department of Electronics and Communication Engineering

M.TECH ON VLSI DESIGN

SEMESTER I

Sl. No.	Course		Course Title	BoS	Teaching hrs./week				Examination			Credits	
	Type	Code			Lecture L	Tutorial T	Practical P	Self-Study S	Duration Hrs.	CIE Marks	SEE Marks		Total Marks
1	BSC	MVJ22XXX11	Advanced Engineering Mathematics	Maths	03	00	00	-	03	50	50	100	3
2	IPCC	MVJ22LVL12	VLSI Design with Verilog	ECE	03	00	02	-	03	50	50	100	4
3	PCC	MVJ22LVL13	Advanced Embedded Systems	ECE	03	00	00	-	03	50	50	100	3
4	PCC	MVJ22LVL14	VLSI Testing	ECE	02	00	00	-	03	50	50	100	3
5	PCC	MVJ22LVL15	ASIC Design	ECE	02	00	00	Y	03	50	50	100	4
6	MCC	MVJ22RMI16	Research Methodology and IPR	Humanities	03	00	00	-	03	50	50	100	3
7	PCCL	MVJ22LVSL17	VLSI Design Lab-1	ECE	01	00	02		03	50	50	100	2
8	AUD/AEC	MVJ22AUD18/22AEC18B	BOS recommended ONLINE courses	ECE	Classes and evaluation procedures are as per the policy of the online course providers.								PP
Total					17	00	04	00	21	350	350	700	22

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

Integrated Professional Core Course (IPCC): 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: 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.

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 modelling of systems and algorithms for transient and steady-state operations, thermal study, etc.
7. Work on different software/s (tools) 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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Semester II

Sl. No	Course		Course Title	BoS	Teaching hrs./week				Examination				Credits
	Type	Code			Lecture L	Tutorial T	Practical P	Self-Study S	Duration Hrs.	CIE Marks	SEE Marks	Total Marks	
1	PCC	MVJ22LVL21	VLSI Processing Technology	ECE	02	02	00	00	03	50	50	100	3
2	IPCC	MVJ22LVL22	Design of Analog And Mixed Mode VLSI Circuits	ECE	03	00	02	00	03	50	50	100	4
3	PEC	MVJ22LVL23X	Professional Elective 1	ECE	02	02	00	00	03	50	50	100	3
4	PEC	MVJ22LVL24X	Professional Elective 2	ECE	02	02	00	00	03	50	50	100	3
5	MPS	MVJ22LVL25	Mini Project with Seminar	ECE	00	02	04	Y	--	100	00	100	3
6	PCCL	MVJ22LVLL26	VLSI Design Lab-2	ECE	01	00	02	00	03	50	50	100	02
7	AUD/AEC	MVJ22AUD27	Suggested ONLINE courses	ECE	Classes and evaluation procedures are as per the policy of the online course providers.							PP	
Total					10	08	08	00	15	350	250	600	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 Elective 1		Professional Elective 2	
Course Code under	Course title	Course Code under	Course title
MVJ23LVL23X		22LVS24X	
MVJ22LVL231	Advances in VLSI Design	MVJ22LVL241	Low Power VLSI Design
MVJ22LVL232	Nano-electronics	MVJ22LVL242	SoC Design
MVJ22LVL233	Static Timing Analysis	MVJ22LVL243	System Verilog

Note:

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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Semester III

Sl. No.	Course		Course Title	BoS	Teaching hrs./week				Examination				Credits
	Type	Code			Lecture L	Tutorial T	Practical P	Self-Study S	Duration Hrs.	CIE Marks	SEE Marks	Total Marks	
1	PCC	MVJ22LVL31	CAD of Digital Systems	ECE	03	02	00	-	03	50	50	100	4
2	PEC	MVJ22LVL32X	Professional Elective 3	ECE	03	00	00	-	03	50	50	100	3
3	PEC	MVJ22LVL33X	Professional Elective 4	ECE	03	00	00	-	03	50	50	100	3
4	PROJ	MVJ22LVL34	Project Work Phase -1	ECE	00	00	06	Y	00	100	00	100	3
5	SP	MVJ22LVL35	Societal Project	ECE	00	00	06	-	00	100	00	100	3
6	INT	MVJ22LVL36	Internship	ECE	(06 weeks Internship Completed during the intervening vacation of II and III semesters.)				03	50	50	100	6
Total					09	02	12		12	400	200	600	22

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 elective 3		Professional elective 4	
Course Code under	Course title	Course Code under	Course title
MVJ22LVL321	FinFETs and Other Multi-Gate Transistors	MVJ22LVL331	Reconfigurable Computing
MVJ22LVL322	VLSI Design for Signal Processing	MVJ22LVL332	Long Term Reliability of VLSI Systems
MVJ22LVL323	Advances in Image Processing	MVJ22LVL333	CMOS RF Circuit Design

Note:

- 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.

2. 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.
3. 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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Semester IV

Sl. No.	Course		Course Title	BoS	Teaching hrs./week				Examination			Credits	
	Type	Code			Lecture L	Tutorial T	Practical P	Self-Study S	Duration Hrs.	CIE Marks	SEE Marks		Total Marks
1	HSMC	MVJ22LVL41	Project work phase -2	ECE	00	00	08	Y	03	100	100	200	18
Total					00	00	08	00	03	100	100	200	18

Note:

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 University norms.

Total Credits 22+18+22+18 =80