

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM
SCHEME OF TEACHING AND EXAMINATION FOR
M.Tech. VLSI Design and Embedded Systems

I Semester

CREDIT BASED

Subject Code	Name of the Subject	Teaching hours/week		Duration of Exam in Hours	Marks for		CREDITS
		Lecture	Practical / Field Work / Assignment/ Tutorials		I.A.	Exam	
14ELD11	Advanced Mathematics	4	2	3	50	100	4
14EVE12	Digital VLSI Design	4	2	3	50	100	4
14EVE13	Advanced Embedded Systems	4	2	3	50	100	4
14EVE14	VLSI Process Technology	4	2	3	50	100	4
14EVE15X	Elective - 1	4	2	3	50	100	4
14EVE16	VLSI Design and Embedded System Lab - I	--	3	3	25	50	2
14EVE17	Seminar on Advanced topics from refereed journals	--	3	--	25	--	1
Total		20	16	18	300	550	23

Elective-1:

14 ELD151	Digital System Design using Verilog	14 EVE 154	ASIC Design
14 EVE 152	VLSI Design Automation	14 EVE 155	System Verilog
14 ELD 153	Nanoelectronics		



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VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM
SCHEME OF TEACHING AND EXAMINATION FOR
M.Tech. VLSI Design and Embedded Systems

II Semester

CREDIT BASED

Subject Code	Name of the Subject	Teaching hours/week		Duration of Exam in Hours	Marks for		CREDITS
		Lecture	Practical / Field Work / Assignment/ Tutorials		I.A.	Exam	
14EVE21	Design of Analog and Mixed mode VLSI Circuits	4	2	3	50	100	4
14EVE22	Low Power VLSI Design	4	2	3	50	100	4
14EVE23	VLSI Testing and Verification	4	2	3	50	100	4
14ELD 24	Real Time Operating Systems	4	2	3	50	100	4
14EVE25X	Elective-2	4	2	3	50	100	4
14EVE26	VLSI Design and Embedded System Lab -2		3	3	25	50	2
14EVE27	Seminar on Advanced topics from refereed journals	--	3	--	25	--	1
**Project Phase-I(6 week Duration)							
Total		20	16	18	300	550	23

Elective-2:

14 EVE 251	VLSI for signal processing	14 EVE 254	CMOS RF Circuit Design
14 EVE 252	High Speed VLSI Design	14 EVE 255	SOC Design
14 ELD 253	MEMS		

**** Between the II Semester and III Semester, after availing a vocation of 2 weeks.**



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M.Tech. VLSI Design and Embedded Systems

III Semester: INTERNSHIP #

CREDIT BASED

Course Code	Subject	No. of Hrs./Week		Duration of the Exam in Hours	Marks for		Total Marks	CREDITS
		Lecture	Practical / Field Work		I.A.	Exam		
14EVE31	Midterm Presentation on Internship (After 8 weeks from the date of commencement) *	-	-	-	25	-	25	4
14EVE32	Report on Internship (After 16 weeks from the date of commencement)	-	-	-	75		75	12
14EVE33	Evaluation and Viva-voce	-	-	3	-	50	50	4
	Total	-	-	-	100	50	150	20

* The student shall make a midterm presentation of the activities undertaken during the first 8 weeks of internship to a panel comprising Internship Guide, a senior faculty from the department and Head of the Department.

The College shall facilitate and monitor the student internship program.
The internship report of each student shall be submitted to the University.


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M.TECH. VLSI Design and Embedded Systems

IV Semester

CREDIT BASED

Subject Code	Subject	No. of Hrs./Week		Duration of Exam in Hours	Marks for		Total Marks	CREDITS
		Lecture	Practical / Field Work / Assignment/ Tutorials		I.A.	Exam		
14EVE41	Synthesis and Optimization of Digital Circuits	4	2					
14EVE42X	Elective-3	4	2					
14EVE43	Evaluation of Project Phase-I	-	-	-	25	-	25	1
14EVE44	Phase-II : Midterm evaluation of Project #	-	-	-	25	-	25	1
14EVE45	Evaluation of Project Work and Viva-voce	-	-	3	-	100+100	200	18
Total		8	04	09	150	400	550	28
Grand Total (I to IV Sem.) : 2400 Marks; 94 Credits								

Elective-3:

14 EVE 421	Advances in VLSI Design	14 EVR 424	Advanced Computer Architecture
14 ELD 422	Image and Video Processing	14 EVE 425	Reconfigurable Computing
14 ESP 423	Modern DSP		



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Note:

- 1) Project Phase – I: 6 weeks duration shall be carried out between II and III Semesters. Candidates in consultation with the guides shall carryout literature survey / visit to Industries to finalize the topic of dissertation.
- 2) Project Phase – II: 16 weeks duration during III Semester. Evaluation shall be taken during the Second week of the IV Semester. Total Marks shall be 25.
- 3) Project Evaluation: 24 weeks duration in IV Semester. Project Work Evaluation shall be taken up at the end of the IV Semester Project Work Evaluation and Viva-Voce examinations shall be conducted. Total Marks shall be 250 (Phase I Evaluation: 25 Marks, Phase –II Evaluation: 25 Marks, Project Evaluation marks by Internal Examiner (guide): 50, Project Evaluation marks by External Examiner: 50, marks for external and 100 for viva-voce).

Marks of Evaluation of Project;

- The L.A. Marks of Project Phase – I & II shall be sent to the University along with Project Work report at the end of the Semester.
- 4) During the final viva, students have to submit all the reports.
 - 5) The Project Valuation and Viva-Voce will be conducted by a committee consisting of the following:
 - a) Head of the Department (Chairman)
 - b) Guide
 - c) Two Examiners appointed by the university. (Out of two external examiners at least one should be present).



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CHOICE BASED CREDIT SYSTEM (CBCS)
SCHEME OF TEACHING AND EXAMINATION 2016-2017

M.Tech in VLSI DESIGN AND EMBEDDED SYSTEMS

I SEMESTER

SL. No	Subject Code	Title	Teaching Hours /Week		Examination			Credit
			Theory	Practical/Fi eld Work/ Assignment	Dura tion	I.A. Marks	Theory/ Practical Marks	Total Marks
1	16ELD11	Advanced Engineering Mathematics	4	-	3	20	80	100
2	16EVE12	Digital VLSI Design	4	-	3	20	80	100
3	16EVE13	Advanced Embedded System	4	-	3	20	80	100
4	16EVE14	Low Power VLSI Design	4	-	3	20	80	100
5	16EXX15X	Elective-1	3	-	3	20	80	100
6	16EVE16	VLSI and ES Lab - I		3	3	20	80	100
7	16EVE17	Seminar on advanced topics from refereed journals	-	3	-	100	-	100
TOTAL			19	6	18	220	480	700

Elective -1	
16 FVE151	Digital System Design Using Verilog
16 EVE152	Nanoelectronics
16 EVE153	ASIC Design
16 ELD154	Advanced Computer Architecture


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SCHEME OF TEACHING AND EXAMINATION 2016-2017

M.Tech in VLSI DESIGN AND EMBEDDED SYSTEMS

II SEMESTER

Sl. No	Subject Code	Title	Teaching Hours /Week		Examination				Credit
			Theory	Practical/Fi eld Work/ Assignment	Dura tion	I.A. Marks	Theory/ Practical Marks	Total Marks	
1	16EVE21	Design of Analog and Mixed mode VLSI Circuits	4	-	3	20	80	100	4
2	16EVE22	VLSI Testing	4	-	3	20	80	100	4
3	16EVE23	Advances in VLSI Design	4	-	3	20	80	100	4
4	16EVE24	Real Time Operating System	4	-	3	20	80	100	4
5	16EXX25X	Elective -2	3	-	3	20	80	100	3
6	16EVEL26	VLSI and ES Lab -2		3	3	20	80	100	2
7	16EVE27	Seminar on Advanced topics from refereed journals	-	3	-	100	-	100	1
TOTAL			19	6	18	220	480	700	22

Elective -2	
16EVE251	System Verilog
16EVE252	VLSI Design for Signal processing
16ELD253	MEMS
16EVE254	SoC Design


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III SEMESTER: Internship

Sl. No	Subject Code	Title	Teaching Hours /Week		Duration	Examination			Credit
			Theory	Practical/Field Work/Assignment		I.A. Marks	Theory/Practical Marks	Total Marks	
1	16EVE31	Seminar / Presentation on Internship (After 8 weeks from the date of commencement)	-	-	-	25	-	25	20
2	16EVE32	Report on Internship	-	-	-	25	-	25	
3	16EVE33	Evaluation and Viva-Voce of Internship	-	-	-	-	50	50	
4	16EVE34	Evaluation of Project phase -I	-	-	-	50	-	50	1
		TOTAL	-	-	-	100	50	150	21


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IV SEMESTER

Sl. No	Subject Code	Title	Teaching Hours /Week		Duration	Examination		Credit
			Theory	Practical/Field Work/Assignment		1st Marks	Theory/Practical Marks	
1	16ELD41	Synthesis and Optimization of Digital Circuits	4	-	3	20	80	4
2	16EXX42X	Elective-3	3	-	3	20	80	3
3	16EVE43	Evaluation of Project phase -2	-	-	-	50	-	3
4	16EVE44	Evaluation of Project and Viva-Voce	-	-	-	-	100+100	10
TOTAL			-	-	6	90	360	20

Elective -3	
16EVE421	CMOS RF Circuit Design
16ECS422	Advances in Image Processing
16EVE423	High Speed VLSI Design
16ELD424	Reconfigurable Computing

Note:

- Project Phase-1:** 6-week duration shall be carried out between 2nd and 3rd Semester vacation. Candidates in consultation with the guide shall carry out literature survey/ visit to industry to finalize the topic of Project.
- Project Phase-2:** 16-week duration during 4th semester. Evaluation shall be done by the committee constituted comprising of HoD as Chairman, Guide and Senior faculty of the department.
- Project Evaluation:** Evaluation shall be taken up at the end of 4th semester. Project work evaluation and Viva-Voce examination shall be conducted.
 - Internal Examiner shall carry out the evaluation for 100 marks.
 - External Examiner shall carry out the evaluation for 100 marks.
 - The average of marks allotted by the internal and external examiner shall be the final marks of the project evaluation.
 - Viva-Voce examination of Project work shall be conducted jointly by Internal and External examiner for 100 marks.



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SCHEME OF TEACHING AND EXAMINATION FOR M.TECH. COMPUTER SCIENCE and ENGINEERING

I Semester

Subject Code	Name of the Subject	Teaching hours/week		Duration of Exam in Hours	Marks for		Total Marks
		Lecture	Practical / Field Work / Assignment/ Tutorials		I.A.	Exam	
12SCS11	Computer Networks	04	02#	03	50	100	150
12SCS12	Advances in Operating Systems	04	02*	03	50	100	150
12SCS13	Advances in Database Management Systems	04	02*	03	50	100	150
12SCS14	Computer Systems Performance Analysis	04	02#	03	50	100	150
12SCS15x	Elective – I	04	02	03	50	100	150
12SCS16	Seminar	--	03	--	50	--	50
Total		20	13	15	300	500	800

Elective I

- 12SCS151 Advances in Digital Image Processing
- 12SCS152 Computer Graphics & Visualization
- 12SCS153 Optical Networks
- 12SCS154 Embedded Systems

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II Semester

Subject Code	Name of the Subject	Teaching hours/week		Duration of Exam in Hours	Marks for		Total Marks
		Lecture	Practical / Field Work / Assignment / Tutorials		I.A.	Exam	
12SCS21	Formal Models in Computer Science	04	2*	03	50	100	150
12SCS22	Advanced Algorithms	04	2*	03	50	100	150
12SCS23	Advances in Computer Architecture	04	2#	03	50	100	150
12SCS24	Cloud Computing	04	2#	03	50	100	150
12SCS25x	Elective – II	04	2	03	50	100	150
	**Project Phase-II(6 Week Duration)				--		--
12SCS26	Seminar		03		50	--	50
Total		20	13	15	300	500	800

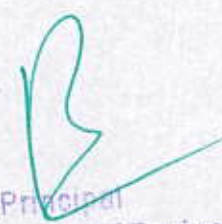
Elective – II

12SCS251 Topics in Multimedia Communications

12SCS252 Artificial Intelligence and Agent Technology

12SCS253 Protocols Engineering

** Between the II Semester and III Semester after availing a vocation of 2 weeks.


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III Semester

Subject Code	Name of the Subject	No. of Hrs./Week		Duration of Exam in Hours	Marks for		Total Marks
		Lecture	Field Work / Assignment / Tutorials		I.A.	Exam	
12SCS31	Information Security	4	--	3	50	100	150
12SCS32x	Elective-III	4	2	3	50	100	150
12SCS33x	Elective-IV	4	2	3	50	100	150
12SCS34	Project Phase-II		\$				
12SCS35	Evaluation of Project Phase - I	-	3	-	50	-	50
Total		12	07	09	200	300	500

Elective - III

12SCS321 Wireless and Cellular Networks
 12SCS322 Advances in Storage Area Networks
 12SCS323 Advances in Pattern Classification
 12SCS324 Multicore Architecture & Programming

Elective - IV

12SCS331 Analysis of Computer Networks
 12SCS332 Data Mining and Warehousing
 12SCS333 Advances in VLSI

\$ 3 Days Course work and 3 days for Project work


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IV Semester

Course Code	Name of the Subject	No. of Hrs./Week		Duration of the Exam in Hours	Marks for		Total Marks
		Lecture	Practical / Field Work		I.A.	Exam	
12SCS41	Evaluation of Project Phase – II	-	-	-	50	-	50
12SCS42	Evaluation of Project work – III	-	-	-	50	-	50
12SCS43	Project work evaluation and Viva-voce	-	-	3	-	100+100	200
	Total	-	-	03	100	200	300
Grand Total (I to IV Sem.) : 2400							

Note: Project work shall be continuously evaluated for phase I, phase II and after completion of the project.


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SCHEME OF TEACHING AND EXAMINATION FOR
M.TECH(COMPUTER SCIENCE and ENGINEERING)

I Semester

Total Credits: 23

Subject Code	Name of the Subject	Teaching hours/week		Duration of Exam in Hours	Marks for		Total Marks	CREDITS
		Lecture	Practical / Fieldwork / Assignment / Tutorials		I.A.	Exam		
14SCS11	Advances in Operating Systems	4	--	03	50	100	150	4
14SCS12	Cloud Computing	4	2 *	03	50	100	150	4
14SCS13	Advances in Data Base Management System	4	2 *	03	50	100	150	4
14SCS14	Multi Core Architecture and Programming	4	2	03	50	100	150	4
14SCS15x	Elective – I	4	2	03	50	100	150	4
14SCS16	Advances in Operating Systems Laboratory	0	3	03	25	50	75	2
14SCS17	Seminar #	0	3	--	25	--	25	1
Total		20	13	18	300	550	850	23

Elective I:

- 14SCS151 Advances in Digital Image Processing
 14SCS152 Advances in Storage Area Networks
 14SCS153 Embedded Computing Systems
 14SCS154 Advances in Computer Graphics


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M.TECH(COMPUTER SCIENCE and ENGINEERING)

II Semester

Total Credits: 23

Subject Code	Name of the Subject	Teaching hours/week		Duration of Exam in Hours	Marks for		Total Marks	CREDIT S
		Lecture	Practical / Fieldwork/ Assignment / Tutorials		I.A.	Exam		
14SCS21	Managing Big Data	4	2 *	03	50	100	150	4
14SCS22	Advances in Computer Networks	4	2 *	03	50	100	150	4
14SCS23	Advanced Algorithms	4	--	03	50	100	150	4
14SCS24	Artificial Intelligence and Agent Technology	4	2	03	50	100	150	44
14SCS25x	Elective – II	4	2	03	50	100	150	4
14SCS26	Advanced Algorithms Laboratory	0	3	03	25	50	75	2
14SCS27	Seminar #	0	3	--	25	--	25	1
	** Project Phase I (6 Week Duration)	--	--	--	--	--	--	--
Total		20	13	18	300	550	850	23

ELECTIVE- II

14SCS251 Web Services

14SCS252 Information and Network Security

14SCS253 Pattern Recognition

14SCS254 Optical Networks

** Between the II Semester and III Semester after availing a vacation of 2 weeks.


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M.TECH(COMPUTER SCIENCE and ENGINEERING)

III Semester: INTERNSHIP

Total Credits: 20

Subject Code	Name of the Subject	No. of Hrs./Week		Duration of the Exam in Hours	Marks for		Total Marks	CREDITS
		Lecture	Practical / Fieldwork		I.A.	Exam		
14SCS31	Seminar / Presentation on Internship (After 8 weeks from the date of commencement) *	--	--	--	25	--	25	1
14SCS32	Report on Internship **	--	--	--	--	75	75	15
14SCS33	Evaluation and Viva-voce	--	--	3	--	50	50	4
	Total	--	--	3	25	125	150	20

*The student shall make a midterm presentation of the activities undertaken during the first 8 weeks of internship to a panel comprising Internship Guide, a senior faculty from the department and Head of the Department.

The College shall facilitate and monitor the student internship program.

The internship report of each student shall be submitted to the University.

**Between the III Semester and IV Semester after availing a vacation of 2 weeks.

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SCHEME OF TEACHING AND EXAMINATION FOR
M.TECH(COMPUTER SCIENCE and ENGINEERING)

IV Semester

Total Credits: 28

Subject Code	Name of the Subject	Teaching hours/week		Duration of Exam in Hours	Marks for		Total Marks	CREDITS
		Lecture	Fieldwork/ Assignment / Tutorials		I.A.	Exam		
14SCS41	Machine Learning Techniques	4	2 *	03	50	100	150	4
14SCS42x	Elective-III	4	2	03	50	100	150	4
14SCS43	Evaluation of Project Phase-II	0	--	0	25	--	25	1
14SCS44	Evaluation of Project Phase-III	0	--	0	25	--	25	1
14SCS45	Evaluation of Project Work and Viva-voce	--	3	03	--	100 + 100	200	18
Total		08	07	09	150	400	550	28
Grand Total (I to IV Sem.)		Marks: 2400 ; Credits : 94						

Elective – III

14SCS421 Computer Vision

14SCS422 Business Intelligence and its Applications

14SCS423 Agile Technologies

14SCS424 Wireless Network and Mobile Computing

L- Lecture , T- Tutorial, P- Practical

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Note:

*Lab Classes for these Core Subjects are Compulsory (Practical will be Evaluated for 20 marks and Internal assessment for 30 marks). Lab journals Should be Maintained.

Seminar: Topics should be chosen from IEEE/ACM/Elsevier/Springer/any Refereed - Journals /Transactions. Encourage students to convert these seminar topics into a good survey paper or Technical paper.

1).Project Phase – I: 6 weeks duration shall be carried out between II and III Semester. Candidates in consultation with guide shall carryout literature survey / visit to Industries to finalize the topic of dissertation.

2) Internship:- 24 weeks Duration in 3rd Semester, Evaluation of Marks - Presentation : 25 marks, Report writing and Submission :75 marks and At the end of Internship Viva-Voce Exams shall be conducted for 50 marks.

3).Project Work : 20 weeks duration in IV Semester carries total marks of 250.

4)Project Phase II: 4 days for project work in a week during IV Semester. Evaluation shall be taken during the 8th week of the IV Semester. Total Marks shall be 25.

5).Project Phase – III: Evaluation shall be taken up at the end of the IV Semester for 25 marks. After the Project report is submitted, Project Work Evaluation and Viva-Voce Examination shall be conducted. Total Marks Shall be $50+50+100=200$ (50 Marks for Internal Guide,50 Marks for External and 100 for Viva-Voce).

Marks of Evaluation of Project:

- I) The I.A. Marks of Project Phase – II & III shall be sent to the University along with Project Work report at the end of the Semester.
- II) The Project Valuation and Viva-Voce will be conducted by a committee consisting of the following:
 - a) Head of the Department (Chairman)
 - b) Guide
 - c) Two Examiners appointed by the university.(out of two external examiners at least one should be present).


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SCHEME OF TEACHING AND EXAMINATION 2016-2017

M. Tech. (Computer Science & Engineering)

II Semester

Subject Code	Name of the Subject	Teaching hours/week		Duration of Exam in Hours	Marks for		CREDITS
		Lecture	Practical / Field Work / Assignment/ Tutorials		I.A.	Exam	
16SCS21	Managing Big Data	4	--	3	20	80	4
16SCS22	Advances in Computer Networks	4	--	3	20	80	4
16SCS23	Advanced Algorithms	4	--	3	20	80	4
16SCS24	Internet of Things	4	--	3	20	80	4
16SCS25x	Course Elective - II	4	--	3	20	80	3
16SCS26	Mini-project	--	3 hrs lab	3	20	80	2
16SCS27	Seminar	--	--	--	100	--	1
Total		20	3	18	220	480	22

Course Elective II

16SCS251	Artificial Intelligence and Agent Technology
16SCS252	Pattern Recognition
16SCS253	Information and Network Security
16SCS254	Web Services


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SCHEME OF TEACHING AND EXAMINATION 2016-2017

M. Tech. (Computer Science & Engineering)

III SEMESTER: Internship			CREDIT BASED						
SL. No	Subject Code	Title	Teaching Hours /Week		Examination				Credit
			Theory	Practical/Field Work/Assignment	Duration	L.A. Marks	Theory/Practical Marks	Total Marks	
1	16SCS31	Seminar / Presentation on Internship (After 8 weeks from the date of commencement)	-	-	-	25	-	25	20
2	16SCS32	Report on Internship	-	-	-	25	-	25	
3	16SCS33	Evaluation and Viva-Voce of Internship	-	-	-	-	50	50	1
4	16SCS34	Evaluation of Project phase - I	-	-	-	50	-	50	
TOTAL			-	-	-	100	50	150	21

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M. Tech. (Computer Science & Engineering)

IV SEMESTER		CREDIT BASED						
Sl. No	Subject Code	Title	Teaching Hours /Week		Examination			Credit
			Theory	Practical/Field Work/Assignment	Duration	I.A. Marks	Theory/Practical Marks	Total Marks
1	16SCS41	Machine Learning Techniques	4	-	3	20	80	100
2	16SCS42x	Course Elective-III	3	-	3	20	80	100
3	16SCS43	Evaluation of Project phase -2	-	-	-	50	-	50
4	16SCS44	Evaluation of Project and Viva-Voce	-	-	-	-	100+100	200
TOTAL			7	-	6	90	360	450
								20

Elective	
16SCS421	Computer Vision
16SCS422	Business Intelligence and its Applications
16SCS423	Agile Technologies
16SCS424	Wireless Network and Mobile Computing

Note:

- Project Phase-1:** 6 week duration shall be carried out between 2nd and 3rd Semester vacation. Candidates in consultation with the guide shall carry out literature survey/visit industries to finalize the topic of Project.
- Project Phase-2:** 16-week duration during 4th semester. Evaluation shall be done by the committee constituted comprising of HoD as Chairman, Guide and Senior faculty of the department.
- Project Evaluation:** Evaluation shall be taken up at the end of 4th semester. Project work evaluation and Viva-Voce examination shall be conducted
- Project evaluation:**
 - Internal Examiner shall carry out the evaluation for 100 marks.
 - External Examiner shall carry out the evaluation for 100 marks.
 - The average of marks allotted by the internal and external examiner shall be the final marks of the project evaluation.
 - Viva-Voce examination of Project work shall be conducted jointly by Internal and External examiner for 100 marks.