### JBOS 10.02.2023 / V5

# VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

**B.E. in Electronics and Communication Engineering** 

## Scheme of Teaching and Examinations 2022

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2023-24)

III SEMESTER

20	900	350	550	Total									
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	100	1	100			2	0	0	Physical Education Director	Physical Education (PE) (Sports and Athletics)	врек359	MC	9
-									NSS coordinator	National Service Scheme (NSS)	BNSK359		
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-	Foo	5	2	3		laboratory	a course is a	Ifa		Course-III	BXX358x	SEC	00
-	130	5	5	4		0	0	1		Ability Enhancement Course/Skill Enhancement		AFC/	
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+	100	1	100	01		2	0	0	Any Department	Social Connect and Responsibility	BSCK307	VHU	7
-	100	50	50	03		0	0	ω	TD: PSB:	ESC/ETC/PLC	вхх306х	ESC	6
1	100	50	50	03		2	0	0	TD: ECE PSB: ECE	Analog and Digital Systems Design Lab	BECL305	PCCL	5
1	100	50	50	03		0	0	ω	TD: ECE PSB: ECE	Network Analysis	BEC304	PCC	4
1	100	50	50	03		2	0	ω	TD: ECE PSB: ECE	Electronic Principles and Circuits	BEC303	IPCC	ω
1	100	50	50	03		2	0	ω	TD: ECE PSB: ECE	Digital System Design using Verilog	BEC302	IPCC	2
1	100	50	50	03		0	0	ω	TD- Maths PSB - Maths	AV Mathematics-III for EC Engineering	ВМАТЕСЗ01	PCC	jub
1					s	P	7	-					
	Total Marks	SEE Marks	CIE Marks	Duration in hours	SDA	Practical/ Drawing	Tutorial	Theory Lecture	Teaching epartment (TD) and Question Paper Setting Board (PSB)	Course Title	Course Code	Course	SI.
		Examination	Exami			rs /Week	Teaching Hours /Week	Te					

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



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	Engineering Science Course (ESC/ETC/PLC)	ourse (ESC/ETC/PL	C
BEC306A	Electronic Devices	BEC306C	Computer Organization and Architecture
BEC306B	Sensors and Instrumentation	BEC306D	Applied Numerical Methods for EC Engineers
	Ability Enhancement Course – III	ent Course - III	
BEC358A	LABVIEW programming	BEC358C	C++ Basics
BEC358B	MATLAB Programming	BEC358D	IOT for Smart Infrastructure
Professional Core			

the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-23 may please be referred 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 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 nise illediy illegiated with piactical

not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the course is mandatory for the award of degree events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The National Service Scheme / Physical Education / Yoga: All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III

### JBOS 10.02.2023 / VS

Int Of Electronics & Communication

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# VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

B.E. in Electronics and Communication Engineering

## Scheme of Teaching and Examinations2022

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

(Effective from the academic year 2023-24)

IV SEMESTER

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, SEE: Sernester End Evaluation. K:This letter in the course code indicates common to all the stream of engineering.

Lab using C	Data Structures Lab using C	BEC456D	Programmable Logic Controllers	BEC456B
	Octave Programming	BEC456C	Microcontroller Lab	BEC456A
	ent Course - IV	Ability Enhancement Course / Skill Enhancement Course - IV		
	Data Structures using C	BEC405D	Industrial Electronics	BEC405B
	Operating Systems	BEC405C	Microcontrollers	BEC405A
	C/PLC)	Engineering Science Course (ESC/ETC/PLC)		

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 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 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 leacning

events shall be appropriately scheduled by the colleges and the same shall be reflected in the calendar prepared for the NSS, PE, and Yoga activities. These courses shall semester to the VI semester (for 4 semesters). Successful completion of the registered course and requisite CIE score is mandatory for the award of the degree. The not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the courses is mandatory for the award of degree. (PE)(Sports and Athletics), and Yoga(YOG) with the concerned coordinator of the course during the first week of III semesters. Activities shall be carried out between III National Service Scheme / Physical Education / Yoga: All students have to register for any one of the courses namely National Service Scheme (NSS), Physical Education the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-23

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B.E. in Electronics and Communication Engineering (ECE)

Scheme of Teaching and Examinations 2021 Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the academic year 2021 - 22)

30	MESTER			Teachin	g Hours	/Week	A STATE OF THE PARTY OF THE PAR		Exami	nation		
SI. No	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Theory	Tutorial	Practical/ Drawing	Self -Study	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
			D 8 8 8	L	т	Р	5					
1	BSC 21EC51	Digital Communication	TD: ECE PSB: ECE	3	0	0	1	03	50	50	100	3
2	IPCC 21ECS2	Computer Organization & ARM Microcontroller	TD: ECE, CSE PSB: ECE	3	0	2		03	50	50	100	
3	PCC 21ECS3	Computer Communication Networks	TD: ECE PSB: ECE	3	0	0	1	03	50	50	100	3
4	PCC 21EC54	NElectromagnetics Wavess	TD: ECE PSB: ECE	3	0	0		03	50	50	100	3
5	PCC 21ECL55	Communication Lab II		0	0	2		03	50	50	100	1
6	AEC 21EC56	Research Methodology & Intellectual Property Rights	TD: Any Department PSB: As identified by University	2	0	0		02	50	50	100	2
7	HSMC 21CIV57	Environmental Studies	TD: Civil/ Environmental /Chemistry/ Biotech. PSB: Civil Engg	1	0	0		1	50	50	100	1
-				If offe		Theory co	urses	01		100000		
	AEC		Concerned	1	0	0			50	50	100	1
8	21EC58X	Ability Enhancement Course-V	Board			s lab. cou	rses	02				
	ZILCJOX			0	0	2		Total	400	400	800	18

		<b>Ability Enhancement Cours</b>	e - V	
		21EC583	Java Programming	
21EC581	IoT (Internet of Things) Lab	21EC584	Data Structures Using C++	
21EC582	Communication Simulink Toolbox	ZIECSO!		

Note: BSC: Basic Science Course, PCC: Professional Core Course, IPCC: Integrated Professional Core Course, AEC -Ability Enhancement Course INT -Internship, HSMC: Humanity and Social Science & Management Courses.

L -Lecture, T - Tutorial, P- Practical/ Drawing, S - Self Study Component, CIE: Continuous Internal Evaluation, SEE: Semester End Examination.

Integrated Professional Core Course (IPCC): refers to Professional Theory Core Course 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). Theory part of the IPCC shall be evaluated both by CIE and SEE. The practical part shall be evaluated by CIE only and there shall be no SEE. For more details the regulation governing the Degree of Bachelor of Engineering /Technology (BE/B.Tech.) 2021-22 may be referred.

> Dept. Of Electronics & Communic Alva' institute of Eng.; . Tachnu Miar, MOODBION - 914 Ado

B.E. in Electronics and Communication Engineering (ECE)

Scheme of Teaching and Examinations 2021
Outcome-Based Education(OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2021 - 22)

				Teaching	Hours	/Week			Exam	nation	-	-
SI. No	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Theory	Tutorial	Practical/ Drawing	Self -Study	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
			۵	L	Т	P	5				and the second s	
1	HSMC 21EC61	Technological Innovation  Management and Entrepreneurship	Any Department	3	0	0	0	03	50	50	100	3
2	IPCC 21EC62	CMicrowave Theory &	TD: ECE PSB: ECE	3	0	2		03	50	50	100	4
3	PCC 21EC63	VLSI Design & Testing	TD: ECE PSB: ECE	3	0	0		03	50	50	100	3
4	PEC 21EC64x	Professional Elective Course-I	TD: ECE PSB: ECE					03	50	50	100	3
5	OEC 21EC65x	Open Elective Course-I	Concerned Department					03	50	50	100	3
6	PCC 21ECL66	VLSI Laboratory		0	0	2		03	50	50	100	1
7	MP 21ECMP67	Mini Project			on bet	ours /wee ween the dents.			100	-	100	2
8	INT 21INT68	Innovation/Entrepreneurship /Societal Internship	Completed during and V semesters	g the inte			of IV		100	-	100	3
								Total	500	300	800	22

	Prof	fessional Elective -	I .
21EC641	Artificial Neural Networks (L:T:P :: 2:2:0)	21EC643	Python Programming (L:T:P :: 2:0:2)
21EC642	Cryptography (L:T:P :: 2:2:0)	21EC644	Micro Electro Mechanical Systems (L:T:P :: 3:0:0)
	Open Electives – I offered by the	he Department to	other Department students
2150651			
21EC651	Communication Engineering (L:T:P :: 3:0:0)	21EC653	Basic VLSI Design (L:T:P :: 3:0:0)
21EC651 21EC652			

Note: HSMC: Humanity and Social Science & Management Courses, IPCC: Integrated Professional Core Course, PCC: Professional Core Course, PEC: Professional Elective Courses, OEC—Open Elective Course, MP—Mini Project, INT—Internship.

L-Lecture, T-Tutorial, P-Practical / Drawing, S-Self Study Component, CIE: Continuous Internal Evaluation, SEE: Semester End Examination.

Integrated Professional Core Course (IPCC): Refers to Professional Theory Core Course 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 CIE only and there shall be no SEE. For more details, the regulation governing the Degree of Bachelor of Engineering /Technology (BE/B.Tech) 2021-22 may be referred.

### 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 out of five courses. The minimum students' strength for offering professional electives is 10. However, this conditional shall not be applicable to cases where the admission to the programme is less than 10.

### **Open Elective Courses:**

Students belonging to a particular stream of Engineering and Technology are not entitled for the open electives offered by their parent Department. However, they can opt an elective offered by other Departments, provided they satisfy the prerequisite condition if any. Registration to open electives shall be documented under the guidance of the Program Coordinator/ Advisor/Mentor.

Selection of an open elective shall not be allowed if,

- (i) The candidate has studied the same course during the previous semesters of the program.
- (ii) The syllabus content of open electives is similar to that of the Departmental core courses or professional electives.
- (iii) A similar course, under any category, is prescribed in the higher semesters of the program.

Dept. Of Electronics & Communit Alva' Institute of Engg. & Technology
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Medicine, Arts, Commerce, etc., can seek permission, at least one month before the commencement of the semester, from the University by submitting a copy of the syllabus along with the details of expertise available to teach the same in the college. The minimum students' strength for offering open electives is 10. However, this conditional shall not be applicable to cases where the admission to

the programme is less than 10.

Mini-project work: Mini Project is a laboratory-oriented course which will provide a platform to students to enhance their practical knowledge and skills by the development of small systems/applications.

Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary Mini- project can be assigned to an individual student or to a group having not more than 4 students.

CIE procedure for Mini-project:

- (i) Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two faculty members of the Department, one of them being the Guide. The CIE marks awarded for the Mini-project work shall be based on the evaluation of project report, project presentation skill, and question and answer session in the ratio of 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.
- (ii) Interdisciplinary: Continuous Internal Evaluation shall be group-wise at the college level with the participation of all the guides of the project. The CIE marks awarded for the Mini-project, shall be based on the evaluation of project 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. No SEE component for Mini-Project.

### VII semester Class work and Research Internship /Industry Internship (21INT82)

### Swapping Facility

Institutions can swap VII and VIII Semester Scheme of Teaching and Examinations to accommodate research internship/ industry internship after the VI semester.

(2) Credits earned for the courses of VII and VIII Semester Scheme of Teaching and Examinations shall be counted against the corresponding semesters whether VII or VIII semester is completed during the beginning of IV year or later part of IV year of the program.

### Elucidation:

At the beginning of IV year of the programme i.e., after VI semester, VII semester classwork and VIII semester Research Internship /Industrial Internship shall be permitted to be operated simultaneously by the University so that students have ample opportunity for internship. In other words, a good percentage of the class shall attend VII semester classwork and similar percentage of others shall attend to Research Internship or Industrial Internship.

Research/Industrial Internship shall be carried out at an Industry, NGO, MSME, Innovation centre, Incubation centre, Start-up, Centers of Excellence (CoE), Study Centre established in the parent institute and /or at reputed research organizations / institutes. The intership can also be rural internship.

The mandatory Research internship /Industry internship is for 24 weeks. The internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not take up/complete the internship shall be declared fail and shall have to complete during the subsequent University examination after satisfying the internship requirements.

### INT21INT82Research Internship/Industry Internship/Rural Internship

Research internship: A research internship is intended to offer the flavour of current research going on in the research field. It helps students get familiarized with the field and imparts the skill required for carrying out research.

Industry internship: Is an extended period of work experience undertaken by students to supplement their degree for professional development. It also helps them learn to overcome unexpected obstacles and successfully navigate organizations, perspectives, and cultures. Dealing with contingencies helps students recognize, appreciate, and adapt to organizational realities by tempering their knowledge with practical constraints.

The faculty coordinator or mentor has to monitor the students' internship progress and interact with them to guide for the successful completion of the internship.

The students are permitted to carry out the internship anywhere in India or abroad. University shall not bear any expenses incurred in respect of internship.

> Institute of Engg. & Technolog MINER, MOODBIDRI - 574 225

Scheme of Teaching and Examination 2018-19
Outcome Based Education(OBE) and Choice Based Credit System (CBCS)

II SEMESTER (Effective from the academic year 2018 – 19)

1					Teachi	ng Hour	s /Week		Exam	ination		I
7.0		rse and	Course Title	Teaching Department	Theory Lecture	Tutorial	Practical/ Drawing	Juration in hours	TE Marks	SEE Marks	otal Marks	Credits
1	PCC	18EC71	Communication		L	T	P	-	0	8	-	
2	PCC	18EC72	Computer Networks VLSI Design		3			03	40	60	100	3
3	PEC	18XX73X			3			03	40	60	100	3
4	PEC	18XX74X	Professional Elective - 2		3			03	40	60	100	3
5	OEC	18XX75X	Professional Elective - 3		3			03	40	60	100	3
6	PCC	18ECL76	Open Elective -B		3			03	40	60	100	3
7	PCC	18ECL77	Computer Networks Lab			2	2	03	40	60	100	2
. 8	Project	18ECP78	VLSI Laboratory			2	2	03	40	60	100	2
Auguston	William Co.	TOLCP/8	Project Work Phase - 1				2		100		100	1
9	Internship	-	Internship 🕝	(If not com carried out	pleted dur	ing the v	vacation of	f VI and	VII sem	esters, i	t shall be	2

Note: PCC: Professional core, PEC: Professional Elective

	Professional Elective - 2	
Course code under 18XX73X	Course Title	
18EC731	Real Time System	
18EC732	Satellite Communication	
18EC733	Digital Image Processing	
18EC734	Data Structures using C++	
18EC735	DSP Algorithms & Architecture	

18EC /35	DSP Algorithms & Architecture
	Professional Electives - 3
Course code under 18XX74X	Course Title
18EC741	IOT & Wireless Sensor Networks
18EC742	Automotive Electronics
18EC743	Multimedia Communication
18EC744	Cryptography
18EC745	Machine Learning

Open Elective –B

(i) 18EC751 Communication Theory (ii) 18EC752 Neural Networks

Students can select any one of the open electives offered by other Departments except those that are offered by the parent Department (Please refer to the list of open electives under 18XX75X).

Selection of an open elective shall not be allowed if,

- The candidate has studied the same course during the previous semesters of the programme.
- The syllabus content of open elective is similar to that of the Departmental core courses or professional electives.
- A similar course, under any category, is prescribed in the higher semesters of the programme.

Registration to electives shall be documented under the guidance of Programme Coordinator/ Advisor/Mentor.

### Project work:

Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary project can be assigned to an individual student or to a group having not more than 4 students. In extraordinary cases, like the funded projects requiring students from different disciplines, the project student strength can be 5 or 6.

### CIE procedure for Project Work Phase - 1:

(i) 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 phase -1, shall be based on the evaluation of the project work phase -1 Report (covering Literature Survey, Problem identification, Objectives and Methodology), 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.

(ii) 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 phase -1, shall be based on the evaluation of project work phase -1 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.

Internship: All the students admitted to III year of BE/B Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not take-un/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.



Dept. Of Electronics & Communication Alva' : Institute of Engg. & Technology Mijar, MOOBBIORI - 574 225

Scheme of Teaching and Examination 2018-19 Outcome Based Education(OBE) and Choice Based Credit System (CBCS) (Effective from the academic year 2018 - 19)

VIII	SEMESTER		Teaching Hours /Week			Examination						
SL No	1	rse and	Course Title	Teaching Department	Theory	Tenterrised	Practical Drawing	Duration in hours	CIE Marka	SEE Marks	Total Marks	Credits
		,			-	-		03	40	60	100	1
1	PCC	18EC81	Wireless and Cellular Communication		,3	**				60	100	-
2	PEC	18XX82X	Professional Elective - 4		3	**	4.4	03	40	60	100	8
-	Project	18ECP83	Project Work Phase - 2		**	1.5	2	03	40	-	100	-
-	Seminar	18ECS84	Technical Seminar		**	**	2	03	100	N N	100	and the same of
5	Internship	18EC185	Internship	VI and V	Completed during the vacation/s of VI and VII semesters and /or VII and VIII semesters.)				40	60	100	3
				TOTAL	-	**	4	15	260	240	500	18

Note: PCC Professional Core, PEC Professional Elective

19.	
	Professional Electives - 4
Course code under 18XX82X	Course Title
18EC821	Network Security
18EC822	Micro Electro Mechanical Systems
18EC823	Radar Engineering
18EC824	Optical Communication Networks
18EC825	Biomedical Signal Processing

### IE procedure for Project Work Phase - 2:

(i) 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 phase -2, shall be based on the evaluation of project work phase -2 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.

(ii) 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 phase -2, shall be based on the evaluation of project work phase -2 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.

(i) Single discipline: Contribution to the project and the performance of each group member shall be assessed individually in semester end examination

(ii) Interdisciplinary: Contribution to the project and the performance of each group member shall be assessed individually in semester end examination (SEE) conducted separately at the departments to which the student/s belong to.

Internship: Those, who have not pursued /completed the internship shall be declared as fail and have to complete during subsequent University examination after satisfying the internship requirements.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card. Activity points of the students who have earned the prescribed AICTE activity Points shall be sent the University along with the CIE marks of 8th semester. In case of students who have not satisfied the AICTE activity Points at the end of eighth semester, the column under activity Points shall be marked NSAP (Not Satisfied Activity Points).

Bept. Of Electronics & Communication Aiva' - Institute of Enga. & Technology Mijar, MOODBIDRI - 574 225