Sant Gadge Baba Amravati University, Amravati

Scheme of Implementation for

Four Year Undergraduate Degree Programme in
Engineering and Technology

B.E. in ELECTRONICS AND TELECOMMUNICATION ENGINEERING

in the faculty of

Science and Technology

ACADEMIC EVALUATION SCHEME/CREDIT SYSTEM

Year: 2024-25

(Scheme of Teaching, Learning, and Examination & Evaluation w.e.f. 2024-2025 and onwards)

	Scheme for First Year Four Year Undergraduate Engineering Degree Programme Semester -I – [Common for all branches]												
Sr No.	**Course Name**	**Code**	**Course Plan per Week (Hrs.)**				**Credits**	**Theory Evaluation**		**Practical Evaluation**		**Total**	**ESE Time Hrs.)**
			L	**P**	**T**	**Hrs.**		**IE**	**ESE**	**INT**	**EXT**		
	Core Courses												
1	Applied Mathematics -I (BSC)	1AL100BS	3	0	0	3	3	40	60			100	3.00 Hrs.
2	Engineering Physics (BSC)	1AL101BS	3	0	0	3	3	40	60			100	3.00 Hrs.
3	Computer Programming (ESC)	1AL102ES	3	0	0	3	3	40	60			100	3.00 Hrs.
4	Engineering Mechanics (ESC)	1AL103ES	3	0	0	3	3	40	60			100	3.00 Hrs.
	Laboratory Courses												
5	Engineering Physics Lab (BSC)	1AL104BS	0	2	0	2	1			25	25	50	
6	Computer Programming Lab (ESC)	1AL105ES	0	2	0	2	1			25	25	50	
7	Engineering Mechanics Lab (ESC)	1AL106ES	0	2	0	2	1			25	25	50	
8	Workshop (ESC)	1AL107ES	0	2	0	2	1			25	25	50	
	Vocational and Skill Enhancement Courses (VSEC)												
9	Technical Department Specific: Electrical Measurements & Measuring Instruments	1AL108VS	1	2	0	3	2			50	-	50	
	Ability Enhancement Courses (AEC)												
10	Professional Communication	1AL109AE	1	2	0	3	2			25	25	50	
	Co-curricular Course (CC)												
11	Co-curricular Course (CC)	1AL110CC	0	4	0	4	2			50	-	50	
	TOTAL		14	16	0	30	**22**					**750**	

L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

Note: Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours)

	Scheme for First Year Four Year Undergraduate Engineering Degree Programme Semester -II – [Common for all branches]												
Sr No.	**Course Name**	**Code**	**Course Plan per Week (Hrs.)**				**Credits**	**Theory Evaluation**		**Practical Evaluation**		**Total**	**ESE Time Hrs.)**
			L	**P**	**T**	**Hrs.**		**IE**	**ESE**	**INT**	**EXT**		
	Core Courses												
1	Applied Mathematics -II (BSC)	2AL111BS	3	0	0	3	3	40	60			100	3.00 Hrs.
2	Engineering Chemistry (BSC)	2AL112BS	3	0	0	3	3	40	60			100	3.00 Hrs.
3	Basic Electrical Engineering (ESC)	2AL113ES	3	0	0	3	3	40	60			100	3.00 Hrs.
4	Engineering Graphics (ESC)	2AL114ES	2	0	0	2	2	40	60			100	3.00 Hrs.
	Laboratory Courses												
5	Engineering Chemistry Lab (BSC)	2AL115BS	0	2	0	2	1			25	25	50	
6	Basic Electrical Engineering Lab (ESC)	2AL116ES	0	2	0	2	1			25	25	50	
7	Engineering Graphics Lab (ESC)	2AL117ES	0	2	0	2	1			25	25	50	
	Vocational and Skill Enhancement Courses (VSEC)												
8	Technical Department Specific: Electronic Workshop	2AL118VS	1	2	0	3	2			50	-	50	
	Programme Core Course (PCC)												
9	Introduction to Digital Electronics	2AL119PC	2	0	0	2	2	20	30			50	2.00 Hrs.
	Indian Knowledge System (IKS)												
10	Indian Traditional Knowledge	2AL120IK	2	0	0	2	2	20	30			50	2.00 Hrs.
	Co-curricular Course (CC)												
11	Co-curricular Course (CC)	2AL121CC	0	4	0	4	2			50	-	50	
	TOTAL		16	12	0	28	**22**					**750**	

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Note: Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours)

Scheme for Multiple Entry and Exit

Exit option -1 (Level 4.5): Award of UG Certificate in Major with 44 credits and an additional 8 credits				
Exit Courses				
1	3ET241EC	Electronics Servicing and Maintenance	Online Certification Course	4
2	3ET242EC	Assembly & Maintenance of Personal Computer	Online Certification Course	4
		OR		
3	3ET404EL	Internship at Industry	Two Months (288 – 320 Hours)	8

	Scheme for Second Year Four Year Undergraduate Engineering Degree Programme B.E. in ELECTRONICS AND TELECOMMUNICATION ENGINEERING (Semester -III)												
Sr No.	**Course Name**	**Code**	**Course Plan per Week (Hrs.)**				**Credits**	**Theory Evaluation**		**Practical Evaluation**		**Total**	**ESE Time Hrs.)**
			L	**P**	**T**	**Hrs.**		**IE**	**ESE**	**INT**	**EXT**		
	Core Courses												
1	Electronics Devices & Circuits (PCC-I)	3ET200PC	3	0	0	3	3	40	60			100	3.00 Hrs.
2	Electro Magnetic Waves (PCC-II)	3ET201PC	3	0	0	3	3	40	60			100	3.00 Hrs.
3	Signals & Systems (PCC-III)	3ET202PC	3	0	0	3	3	40	60			100	3.00 Hrs.
	Laboratory Courses												
4	Comm. Engg. Project/ Field Project	3ET400EL	0	4	0	4	2			25	25	50	
5	Electronics Devices & Circuits Lab (PCC-II)	3ET203PC	0	2	0	2	1			25	25	50	
6	Signals & Systems Lab (PCC-III)	3ET204PC	0	2	0	2	1			25	25	50	
	Multidisciplinary Minor												
7	Multidisciplinary Minor –I*	3ET205MD	2	0	0	2	2	20	30	-	-	50	2.00 Hrs.
	Open Elective other than a particular Program												
8	Open Elective -I	3ET206OE	3	0	0	3	3	40	60	-	-	100	3.00 Hrs.
	HSSMC (Entrepreneurship/ Economics/ Management Course)												
9	Entrepreneurship Development	3ET207EM	2	0	0	2	2	20	30	-	-	50	2.00 Hrs.
	Value Education Course (VEC)												
10	Environmental Science	3AL208VE	2	0	0	2	2	20	30			50	2.00 Hrs.
	TOTAL		17	10	0	27	**22**					**700**	

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Note: Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours)

Open Elective-I: 1) Analog Communication 2) Digital Communication

***Please refer to the list of Multidisciplinary Minor courses attached separately.**

	Scheme for Second Year Four Year Undergraduate Engineering Degree Programme B.E. in ELECTRONICS AND TELECOMMUNICATION ENGINEERING (Semester -IV)												
Sr No.	**Course Name**	**Code**	**Course Plan per Week (Hrs.)**				**Credits**	**Theory Evaluation**		**Practical Evaluation**		**Total**	**ESE Time Hrs.)**
			L	**P**	**T**	**Hrs.**		**IE**	**ESE**	**INT**	**EXT**		
	Core Courses												
1	Analog & Digital Communications (PCC-I)	4ET209PC	3	0	0	3	3	40	60			100	3.00 Hrs.
2	Analog Circuits (PCC-II)	4ET210PC	3	0	0	3	3	40	60			100	3.00 Hrs.
3	Network Theory (PCC-III)	4ET211PC	2	0	0	2	2	40	60			100	3.00 Hrs.
	Laboratory Courses												
4	Analog & Digital Communications Lab (PCC-I)	4ET212PC	0	2	0	2	1			25	25	50	
5	Analog Circuits Lab (PCC-II)	4ET213PC	0	2	0	2	1			25	25	50	
	Multidisciplinary Minor												
6	Multidisciplinary Minor –II*	4ET214MD	2	0	0	2	2	20	30	-	-	50	2.00 Hrs.
	Vocational and Skill Enhancement Courses												
7	VSEC-III: Object Oriented Programming	4ET215VS	1	2	0	3	2			50	-	50	
	Open Elective other than a particular Program												
8	Open Elective- II	4ET216OE	2	0	0	2	2	20	30			50	2.00 Hrs.
	HSSMC (Entrepreneurship/ Economics/ Management Course)												
9	Management Related: Engg. Economics	4ET217EM	2	0	0	2	2	20	30			50	2.00 Hrs.
	(Ability Enhancement Course (AEC)												
10	Modern Indian Language	4AL218AE	2	0	0	2	2			25	25	50	.
	Value Education Course (VEC)												
11	Environmental Science/UHV/VE	4AL219VE	2	0	0	2	2	20	30			50	2.00 Hrs.
	TOTAL		19	06	0	25	**22**					**700**	

L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

Note: Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours)

Open Elective-II: 1) Optical Fiber Communication 2) Satellite Communication

***Please refer list of Multidisciplinary Minor courses attached separately.**

Scheme for Multiple Entry and Exit

Exit option -2 (Level 5.0): Award of UG Diploma in Major with 88 credits and an additional 8 credits				
Exit Courses				
1	5ET243EC	Microprocessors/Microcontrollers based Product Design	Online Certification Course	4
2	5ET244EC	PCB Design and Circuit Simulation	Online Certification Course	4
		OR		
3	5ET405EL	Internship at Industry OR Minor Project	Two Months (288 – 320 Hours)	8

	Scheme for Second Year Four Year Undergraduate Engineering Degree Programme B.E. in ELECTRONICS AND TELECOMMUNICATION ENGINEERING (Semester -V)												
Sr No.	**Course Name**	**Code**	**Course Plan per Week (Hrs.)**				**Credits**	**Theory Evaluation**		**Practical Evaluation**		**Total**	**ESE Time Hrs.)**
			L	**P**	**T**	**Hrs.**		**IE**	**ESE**	**INT**	**EXT**		
	Core Courses												
1	Microcontroller (PCC-I)	5ET220PC	3	0	0	3	3	40	60			100	3.00 Hrs.
2	Digital Signal Processing (PCC-II)	5ET221PC	3	0	0	3	3	40	60			100	3.00 Hrs.
3	Communication Network (PCC-III)	5ET222PC	3	0	0	3	3	40	60			100	3.00 Hrs.
4	Programme Elective Course -I: Power Electronics/Wireless Sensor Networks/Electric Vehicles	5ET223PE	3	0	0	3	3	40	60			100	3.00 Hrs.
	Laboratory Courses												
5	Microcontroller Lab (PCC-I)	5ET224PC	0	2	0	2	1			25	25	50	
6	Digital Signal Processing Lab (PCC-II)	5ET225PC	0	2	0	2	1			25	25	50	
7	Communication Network Lab (PCC-III)	5ET226PC	0	2	0	2	1			25	25	50	
	Multidisciplinary Minor												
8	Multidisciplinary Minor –III*	5ET227MD	2	0	0	2	2	20	30			50	2.00 Hrs.
9	Multidisciplinary Minor –IV*	5ET228MD	2	0	0	2	2	20	30			50	2.00 Hrs.
10	Multidisciplinary Minor Lab. –I*	5ET229ML	0	2	0	2	1			25	25	50	
	Open Elective other than a particular Program												
11	Open Elective- III	5ET230OE	2	0	0	2	2	20	30			50	2.00 Hrs.
	TOTAL		19	08	0	26	**22**					**750**	

L: Lecture P: Practical T: Tutorial MSE: Mid Semester Exam ESE: End Semester Exam IE: Internal Evaluation INT: Internal EXT: External

Note: Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours

Open Elective –III: 1) Introduction to Wireless Communication 2) Introduction to 5G-6G

*Please refer list of Multidisciplinary Minor courses attached separately.

	Scheme for Second Year Four Year Undergraduate Engineering Degree Programme B.E. in ELECTRONICS AND TELECOMMUNICATION ENGINEERING (Semester -VI)												
Sr No.	**Course Name**	**Code**	**Course Plan per Week (Hrs.)**				**Credits**	**Theory Evaluation**		**Practical Evaluation**		**Total**	**ESE Time Hrs.)**
			L	**P**	**T**	**Hrs.**		**IE**	**ESE**	**INT**	**EXT**		
	Core Courses												
1	Digital Image Processing (PCC-I)	6ET231PC	3	0	0	3	3	40	60			100	3.00 Hrs.
2	Embedded Systems (PCC-II)	6ET232PC	3	0	0	3	3	40	60			100	3.00 Hrs.
3	UHF & Microwave Engineering (PCC-III)	6ET233PC	3	0	0	3	3	40	60			100	3.00 Hrs.
4	Program Elective Course -II: Control Systems/Introduction to AI/Satellite Communications	6ET234PE	3	0	0	3	3	40	60			100	3.00 Hrs.
5	Program Elective Course -III: Computer Architecture/Introduction to Machine Learning/Antenna & Wave Propagation	6ET235PE	3	0	0	3	3	40	60			100	3.00 Hrs.
	Laboratory Courses												
6	Digital Image Processing Lab (PCC-I)	6ET236PC	0	2	0	2	1			25	25	50	
7	Embedded Systems Lab (PCC-II)	6ET237PC	0	2	0	2	1			25	25	50	
8	UHF & Microwave Engineering Lab (PCC-III)	6ET238PC	0	2	0	2	1			25	25	50	
	Multidisciplinary Minor												
9	Multidisciplinary Minor –V*	6ET239MD	2	0	0	2	2	20	30			50	2.00 Hrs.
	Vocational and Skill Enhancement Courses												
10	VSEC-IV (Technical Dept. Specific): Introduction to Python	6ET240VS	1	2	0	3	2			50	-	50	
	TOTAL		18	08	0	26	**22**					**750**	

L: Lecture **P: Practical** **T: Tutorial** **ESE: End Semester Exam** **IE: Internal Evaluation** **INT: Internal** **EXT: External**

Note: **Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours)**

***Please refer list of Multidisciplinary Minor courses attached separately.**

Scheme for Multiple Entry and Exit

Exit option -3 (Level 5.5): Award of UG Degree in Major with 132 credits and an additional 8 credits				
Exit Courses				
1	7ET310EC	Certified Database Engineer (Oracle, DB2)	Online Certification Course	4
2	7ET311EC	Certified Cloud Engineer (AWS, AZURE)	Online Certification Course	4
		OR		
3	7ET406EL	Internship at Industry OR Minor Project	Two Months (288 -320 Hours)	8

	Scheme for Second Year Four Year Undergraduate Engineering Degree Programme B.E. in ELECTRONICS AND TELECOMMUNICATION ENGINEERING (Semester -VII)												
Sr No.	**Course Name**	**Code**	**Course Plan per Week (Hrs.)**				**Credits**	**Theory Evaluation**		**Practical Evaluation**		**Total**	**ESE Time Hrs)**
			L	**P**	**T**	**Hrs.**		**IE**	**ESE**	**INT**	**EXT**		
	Core Courses												
1	VLSI (PCC-I)	7ET300PC	3	0	0	3	3	40	60			100	3.00 Hrs.
2	Wireless Communications (PCC-II)	7ET301PC	3	0	0	3	3	40	60			100	3.00 Hrs.
3	Program Elective Course -IV: MEMS/Cloud Computing/Optic Fiber Communications	7ET302PE	3	0	0	3	3	40	60			100	3.00 Hrs.
4	Program Elective Course -V: Introduction to IOT/ Introduction to 5G – 6G / Information Theory & Coding	7ET303PE	3	0	0	3	3	40	60			100	3.00 Hrs.
5	Program Elective Course -VI: Biomedical Engineering/ Smart Sensors & Actuators/ Industrial Automation	7ET304PE	3	0	0	3	3	40	60			100	3.00 Hrs.
	Laboratory Courses												
6	VLSI Lab (PCC-I)	7ET305PC	0	2	0	2	1			25	25	50	
7	IOT Lab (PCC-II)	7ET306PC	0	2	0	2	1			25	25	50	
	Multidisciplinary Minor												
8	Multidisciplinary Minor –VI*	7ET307MD	2	0	0	2	2	20	30			50	2.00 Hrs.
9	Multidisciplinary Minor Lab. –II*	7ET308ML	0	2	0	2	1			25	25	50	.
	Project												
10	Project	7ET401PR	0	4	0	4	2			50	50	100	
	TOTAL		17	10	0	27	**22**					**800**	

L: Lecture **P: Practical** **T: Tutorial** **ESE: End Semester Exam** **IE: Internal Evaluation** **INT: Internal** **EXT: External**

Note: Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours)

	Scheme for Second Year Four Year Undergraduate Engineering Degree Programme B.E. in ELECTRONICS AND TELECOMMUNICATION ENGINEERING (Semester -VIII)												
Sr No.	**Course Name**	**Code**	**Course Plan per Week (Hrs.)**				**Credits**	**Theory Evaluation**		**Practical Evaluation**		**Total**	**ESE Time Hrs)**
			L	**P**	**T**	**Hrs.**		**IE**	**ESE**	**INT**	**EXT**		
	Core Courses												
1	Research Methodology	8ET309RM	4*			4	4	40	60			100	3.00 Hrs.
2	Industry Internship	8ET402EL	0	24	0	24	12			100	200	300	--
3	Project	8ET403PR	0	4	0	4	2			50	50	100	--.
	TOTAL		4	28	0	32	18					**500**	

L: Lecture **P: Practical** **T: Tutorial** **ESE: End Semester Exam** **IE: Internal Evaluation** **INT: Internal** **EXT: External**

Note: Six hours per week are allotted for continuous evaluation process for the above subjects. (Total contact hours per week = 34 Hours)

***The course on Research Methodology may be completed by the student in Online mode (Swayam, MOOC's, any other platform approved by AICTE OR on the LMS platform offered by the Institute).**

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B. E. **ELECTRONICS AND TELECOMMUNICATION ENGINEERING**

Multi -Disciplinary Minors (14 Credits)

SEM	Course Code	Course Type	Credit		Course Title
			T	P	
Sem III	3ET205MD	MDM –I	2	0	Fundamentals of Digital Electronics
Sem IV	4ET214MD	MDM -II	2	0	Digital ICs and applications
Sem V	5ET227MD	MDM -III	2	0	Introduction to Microprocessors
	5ET228MD	MDM -IV	2	0	Microcontroller Applications
	5ET229ML	MDM Lab. -I	0	1	Microprocessor and Microcontroller Lab
Sem VI	6ET239MD	MDM -V	2	0	IoT and Applications
Sem VII	7ET307MD	MDM -VI	2	0	Introduction to Embedded Systems
	7ET308ML	MDM Lab. -II	0	1	Embedded Systems Lab
		Total	**12**	**02**	

Program Elective Courses

(Note: Select any one course from the below list of Program Electives)

Track I: PEC

SEM	Course Code	Course Type	Credits	Course Title
Sem V	5ET223PE1	PEC –I	3	Power Electronics
Sem VI	6ET234PE1	PEC –II	3	Control Systems
Sem VI	6ET235PE1	PEC –III	3	Computer Architecture
Sem VII	7ET302PE1	PEC –IV	3	MEMS
Sem VII	7ET303PE1	PEC -V	3	Introduction to IOT
Sem VII	7ET304PE1	PEC -VI	3	Biomedical Engineering

Track II: PEC

SEM	Course Code	Course Type	Credits	Course Title
Sem V	5ET223PE2	PEC –I	3	Wireless Sensor Networks
Sem VI	6ET234PE2	PEC –II	3	Introduction to AI
Sem VI	6ET235PE2	PEC –III	3	Introduction to Machine Learning
Sem VII	7ET302PE2	PEC –IV	3	Cloud Computing
Sem VII	7ET303PE2	PEC -V	3	Introduction to 5G – 6G
Sem VII	7ET304PE2	PEC -VI	3	Smart Sensors & Actuators

Track III: PEC

SEM	Course Code	Course Type	Credits	Course Title
Sem V	5ET223PE3	PEC –I	3	Electric Vehicles
Sem VI	6ET234PE3	PEC –II	3	Satellite Communications
Sem VI	6ET235PE3	PEC –III	3	Antenna & Wave Propagation
Sem VII	7ET302PE3	PEC –IV	3	Optic Fiber Communications
Sem VII	7ET303PE3	PEC -V	3	Information Theory & Coding
Sem VII	7ET304PE3	PEC -VI	3	Industrial Automation

Open Electives

(Note: Select any one course from the below Tracks of Open Electives)

Track I: OE

SEM	Course Code	Course Type	Credit	Course Title
Sem III	3ET206OE1	OE I	3	**Analog Communication**
Sem IV	4ET216OE1	OE II	2	**Optical Fiber Communication**
Sem V	5ET230OE1	OE III	2	**Introduction to Wireless Communication**
		Total	**7**	

Track II: OE

SEM	Course Code	Course Type	Credit	Course Title
Sem III	3ET206OE2	OE I	3	**Digital Communication**
Sem IV	4ET216OE2	OE II	2	**Satellite Communication**
Sem V	5ET230OE2	OE III	2	**Introduction to 5G-6G**
		Total	**7**	

Multi -Disciplinary Double Minors/Honors (ET) (18 Credits)

Track I: Mobile and Wireless Communication

SEM	Course Code	Credits	Course Title
Sem III	3ET245DH1	4	**Basic Digital communication and Programming**
Sem IV	4ET246DH1	4	**Data and Wireless Communication**
Sem V	5ET247DH1	4	**Mobile Computing**
Sem VI	6ET248DH1	4	**5G and 6G Communications**
Sem VII	7ET407DH1	2	**Mini Project**
	Total	**18**	

Multi -Disciplinary Double Minors/Honors (ET) (18 Credits)

Track II: IoT and Embedded Systems

SEM	Course Code	Credits	Course Title
Sem III	3ET245DH2	4	**Microcontroller & Embedded C**
Sem IV	4ET246DH2	4	**Sensors and Actuators in Embedded Systems**
Sem V	5ET247DH2	4	**Real Time Embedded Systems**
Sem VI	6ET248DH2	4	**Applications of IoT**
Sem VII	7ET407DH2	2	**Mini Project**
	Total	**18**	

Nomenclature:

Courses	
Acronym	**Course/Subject Vertical**
BS	Basic Science Course
BL	Basic Science Laboratory
ES	Engineering Science Course
EL	Engineering Science Laboratory
PC	Program Course
PL	Program Laboratory
PE	Program Elective Course
MD	Multidisciplinary Minor Course
ML	Multidisciplinary Minor Laboratory
OE	Open Elective

Acronym	Course/Subject Vertical
VS	Vocational Skill Enhancement Course
AE	Ability Enhancement Course
EM	Entrepreneurship/Economics/Management Course
IK	Indian Knowledge System
VE	Value Education Course
RM	Research Methodology
FP	Field Project
II	Industry Internship
PR	Project
CC	Co-curricular Course