



BVVS

Basaveshwar Engineering College, Bagalkote

Department of Electronics and Communication Engineering

Vision, Mission Statements and Values Vision

To achieve excellence in electronics and communication engineering through quality education and research for developing competent professionals.

Mission

1. Foster a dynamic teaching and learning process.
2. Encourage research through innovation and collaboration.
3. Imbibe moral, ethical values and social responsibilities.

Values

The values of the department are

1. Work is Worship
2. Ethics and Integrity
3. Empathy and Compassion
4. Indian Ethos
5. Mutual Respect

SWOC Analysis

S:Strength:

1. Infrastructure
 - (i.) ICT enabled classrooms/seminar hall with good ambience.
 - (ii.) Well equipped laboratories to cater curriculum requirements.
 - (iii.) Department library with good number of titles and volumes.
 - (iv.) Scope for academic extension programmes.
2. Faculty
 - (i.) 75% offaculty with Ph.D.
 - (ii.) Facultywithminimumof12yearsteachingexperience.
 - (iii.) Faculty retention ratio is 100 %.
3. Students
 - (i.) Students with academic and competitive bent of mind.
 - (ii.) 75% of the students are placed in reputed industries.
 - (iii.) 10% to 15% of the students are registering for B.E. Honors Degree.
4. Curriculum
 - (i.) Research and industry oriented adaptive Curriculum.
 - (ii.) Curriculum with integrated courses.
5. Alumni
 - (i.) Alumni work in reputed organizations across the world.
 - (ii.) Alumni interactions with students and faculty to bridge the gap between campus and corporate.

W:Weakness:

1. IPR competencies are inadequate.
2. Relatively less number of memberships in professional bodies.
3. Limited collaborative activities.
4. Less number of inter-disciplinary courses and projects.
5. Less number of industry supported laboratories/courses.
6. Inadequate number of funded projects.
7. Less scope for co-curricular and cultural activities.

O:Opportunities:

1. Establishment of Distant Learning Center (DLC) using existing resources.
2. Participation in collaborative projects/research work with allied institutions.
3. Fostering alumni participation in academics and placement activities.
4. Establishment of Skilling Centers for students.
5. Faculty exchange programs with academia and industry.
6. Organizing conferences.
7. Facilitating incubation centers for alumni.
8. Scope for academic extension programmes
9. Training on computer usage/programming languages for general public.
10. Enhancing consultancy activities.

C:Challenges:

1. To incorporate experiential teaching learning process.
2. Adapting curriculum to future industry needs.
3. Fostering collaboration to enhance research, innovation and entrepreneurship activities.
4. Attracting diversified students.
5. Strategies to strengthen the placement activities for higher packages and core companies.
6. Secure additional research grants and consultancy opportunities.
7. Enhance quality publications and file patents.

Knowledge and Attitude Profile (WK)

WK1: A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.

WK2: Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline.

WK3: A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

WK4: Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.

WK5: Knowledge, including efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area.

WK6: Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.

WK7: Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development.

WK8: Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues.

WK9: Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes.

Program Outcomes (POs)

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).

PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO8: Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

Programme Specific Outcomes (PSOs)

1. Analyze and design systems for electronics, communication, and signal processing applications.
2. Use domain specific tools for design, analysis, synthesis, and validation of VLSI and embedded systems
3. Demonstrate the conceptual knowledge with respect to architecture, design analysis and simulation of computer networking and applications

Programme Educational Objectives(PEOs)

PEO1: Our graduates will be able to lead a successful career by solving complex Engineering Problems of society/industry

PEO2: Enable graduates to excel in academia, industry, entrepreneurship and engage in research and lifelong learning

PEO3: Graduates will be able to work effectively as individuals in multidisciplinary environments with high integrity, ethics, human values and societal responsibilities

PEO4: Graduates will be able to exhibit strong leadership, communication, and teamwork skills to succeed in dynamic professional environments and contribute to the global challenges

Suggestive Break-up of Credits for B.E (Common to all Branches)
(For the Students admitted to first year from 2026-27 onwards and to 2nd year lateral entry from 2027-2028 onwards)

Sem.	BSC	ESC/ETC	HSMC	AEC	PCC	PEC	OEC	Proj.	Int.	Total
1.	08	09	02	1(SFH)						20
2.	08	09	02	1(IDT)						20
3.	03				17					20
4.	03		01		16					20
5.			01	2 (SS)	09	03	03	02		20
6.				1(IKS)	13	03	03			20
7.			03		06	06		09		24
8.				3 (MOOCS)			3 (MOOCS)		10	16
Tot.	22	18	09	08	61	12	09	11	10	160

I SEM BE. Scheme of Teaching and Evaluation for 2026-27 Admitted Batch, (Chemistry Cycle)

Sl. No.	Course Category	Course Code	Course Title	Teaching-Learning Scheme				Examination Duration (Hrs/Sem.)		Total Hours	Examination Scheme and Evaluation			Credits (C) =Total Hours/30
				L Hrs/Week (Hrs/Sem.)	T Hrs/Week (Hrs/Sem.)	P Hrs/Week (Hrs/Sem.)	Term Work (TW) and Self Learning (SL) (TW+SL) Hrs/Sem.	CIE	SEE		CIE Marks	SEE Marks	Total Marks	
1.	ASC	1BMAE101C	Differential Calculus and Linear Algebra: EEE stream	4 (56)	0	0	58	03	03	120	50	50	100	04
2.	ASC(IC)	1BCHE102C	Applied Chemistry for EEE stream	3 (42)	0	2(26)	44	05	03	120	50	50	100	04
3.	ETC	1BAIA103C	Introduction to AI and Applications	3(42)	0	0	42	03	03	90	50	50	100	03
4.	ESC	1BISA104N	Essentials of Information Technology	3(42)	0	0	42	03	03	90	50	50	100	03
5.	PLC(IC)	1BCSA105D	Introduction to C Programming (for non-IT programs CV, ME, EEE Streams)	3 (42)	0	2(26)	44	05	03	120	50	50	100	04
6.	AEC	1BHSB106C	Communication Skills	1(14)	0	0	13	03	03	33	50	50	100	01
6.	AEC (NCCMC)	1BHSC107M	Indian Constitution & Engineering Ethics	1(14)	0	0	13	03	-	30	100	-	100	PP
7.	PCCL	1BECA108P	Innovation and Design Thinking (Project-based learning)	0	0	26	00	02	02	30	50	50	100	01
	Total			18(252)	0	4(78)	256	27	20	633	450	350	800	20

II SEM BE. Scheme of Teaching and Evaluation for 2026-27 Admitted Batch, (Physics Cycle)

Sl. No.	Course Category	Course Code	Course Title	Teaching-Learning Scheme				Examination Duration (Hrs/Sem.)		Total Hours	Examination Scheme and Evaluation			Credits (C) =Total Hours/30
				L Hrs/Week (Hrs/Sem.)	T Hrs/Week (Hrs/Sem.)	P Hrs/Week (Hrs/Sem.)	Term Work (TW) and Self Learning (SL) (TW+SL) Hrs/Sem.	CIE	SEE		CIE Marks	SEE Marks	Total Marks	
1.	ASC	1BMAE201C	Calculus, Laplace Transforms and Numerical Techniques for EEE stream	4 (56)	0	0	58	03	03	120	50	50	100	04
2.	ASC(IC)	1BPHE202C	Applied Physics for EEE stream	3 (42)	0	2(26)	44	05	03	120	50	50	100	04
3.	ESC	1BMEE203C	Computer –Aided Engineering Drawing	3(42)	0	0	42	03	03	90	50	50	100	03
4.	PCCL	1BEEA204N	Introduction to Electrical Engineering	3(42)	0	0	42	03	03	90	50	50	100	03
5.	PSC	1BECA205C	Fundamentals of Electronics & Communication Engineering	3(42)	0	0	42	03	03	90	50	50	100	03
6.	AEC	1BHSA206M	Soft Skills	1(14)	0	0	13	03	-	30	100	-	100	PP
7.	HSMC	1BHSA207C	Samskrutika Kannada/Balake Kannada	1(14)	0	0	13	03	03	33	50	50	100	01
8.	PCCL	1BECA208P	Interdisciplinary Project-based Learning	0	0	26	00	02	02	30	50	50	100	01
9.	PCCL	1BECA209L	Fundamentals of Electronics & Communication Engineering Laboratory	0	0	26	00	02	02	30	50	50	100	01
	Total			18(252)	0	2(78)	254	27	22	633	500	400	900	20

III SEM BE. Scheme of Teaching and Evaluation for 2026-27 Admitted Batch

Sl. No.	Course Category	Course Code	Course Title	Teaching-Learning Scheme				Examination Duration (Hrs/Sem.)		Total Hours	Examination Scheme and Evaluation			Credits (C) =Total Hours/30
				L Hrs/Week (Hrs/Sem.)	T Hrs/Week (Hrs/Sem.)	P Hrs/Week (Hrs/Sem.)	Term Work (TW) and Self Learning (SL) (TW+SL) Hrs/Sem.	CIE	SEE		CIE Marks	SEE Marks	Total Marks	
1.	BSC	1BECA301C	Mathematical Methods for Signals and Systems	3 (42)	0	0	42	03	03	90	50	50	100	03
2.	PCC	1BECA302C	Network Analysis	3 (42)	0	0	42	03	03	90	50	50	100	03
3.	PCC	1BECA303C	Electronics Devices and Circuits	3 (42)	0	0	42	03	03	90	50	50	100	03
4.	PCC	1BECA304C	Digital System Design using Verilog	3 (42)	0	0	42	03	03	90	50	50	100	03
5.	PCC	1BECA305C	Liner Integrated Circuits	3 (42)	0	0	42	03	03	90	50	50	100	03
6.	PCC	1BECA306C	Data Structures using C++	3 (42)	0	0	42	03	03	90	50	50	100	03
	PCCL	1BECA307L	Electronic Devices and Circuits Laboratory	0	0	26	00	02	02	30	50	50	100	01
7.	PCCL	1BECA308L	Digital System Design Using Verilog Laboratory	0	0	26	00	02	02	30	50	50	100	01
8	MC	1BHSA460M	Yoga	0	0	2	00	01	--	03	100	0	0	0
		1BHSB460M	National Service Scheme (NSS)	0	0	2	00	01	--	03	100	0	0	0
		1BHSC460M	Physical Education (PE) (Sport sand Athletics)	0	0	2	00	01	--	03	100	0	0	0
	Total			18(252)	0	58	252	25	22	609	700	400	800	20

IV SEM BE. Scheme of Teaching and Evaluation for 2026-27 Admitted Batch

Sl. No.	Course Category	Course Code	Course Title	Teaching-Learning Scheme				Examination Duration (Hrs/Sem.)		Total Hours	Examination Scheme and Evaluation			Credits (C) =Total Hours/30
				L Hrs/Week (Hrs/Sem.)	T Hrs/Week (Hrs/Sem.)	P Hrs/Week (Hrs/Sem.)	Term Work (TW) and Self Learning (SL) (TW+SL) Hrs/Sem.				CIE Marks	SEE Marks	Total Marks	
								CIE	SEE					
1.	PCC	1BECA401C	Digital Signal Processing	3 (42)	0	0	42	03	03	90	50	50	100	03
2.	PCC	1BECA402C	Analog and Digital Communication	3 (42)	0	0	42	03	03	90	50	50	100	03
3.	PCC	1BECA403C	Embedded Systems and ARM Microcontrollers	2 (28)	0	0	26	03	03	60	50	50	100	02
4.	PCC	1BECA404C	Electromagnetic Engineering	3 (42)	0	0	42	03	03	90	50	50	100	03
5.	PCC	1BECA405C	Basics of Artificial Intelligence and Machine Learning	2 (28)	0	0	26	03	03	60	50	50	100	02
6.	HSMC	1BHSA424C	Universal Human Values	1 (14)	0	0	13	02	01	30	50	50	100	01
7.	BSC	1BBTA405C	Biology for Engineers	3 (42)	0	0	42	03	03	90	50	50	100	03
8.	PCCL	1BECA406L	Communication Engineering Laboratory	0	0	26	00	02	02	30	50	50	100	01
9.	PCCL	1BECA407L	Digital Signal Processing Laboratory	0	0	26	00	02	02	30	50	50	100	01
10.	PCCL	1BECA408L	ARM Microcontroller Laboratory	0	0	26	00	02	02	30	50	50	100	01
11.	MC	1BHSA460M	Yoga	0	0	2	00	02	--	04	100	0	0	0
		1BHSB460M	National Service Scheme (NSS)	0	0	2	00	02	--	04	100	0	0	0
		1BHSC460M	Physical Education (PE) (Sport sand Athletics)	0	0	2	00	02	--	04	100	0	0	0
	Total			17(238)	0	58	233	30	23	612	800	500	1000	20

V SEM BE. Scheme of Teaching and Evaluation for 2026-27 Admitted Batch

Sl. No.	Course Category	Course Code	Course Title	Teaching-Learning Scheme				Examination Duration (Hrs/Sem.)		Total Hours	Examination Scheme and Evaluation			Credits (C) =Total Hours/30
				L Hrs/Week (Hrs/Sem.)	T Hrs/Week (Hrs/Sem.)	P Hrs/Week (Hrs/Sem.)	Term Work (TW) and Self Learning (SL) (TW+SL) Hrs/Sem.	CIE	SEE		CIE Marks	SEE Marks	Total Marks	
1.	PCC	1BECA501C	Computer Networks	3 (42)	0	0	42	03	03	90	50	50	100	03
2.	PCC	1BECA502C	Control Systems	3 (42)	0	0	42	03	03	90	50	50	100	03
3.	PEC	1BECX503E	Professional Elective – I	3 (42)	0	0	42	03	03	90	50	50	100	03
4.	OEC	1BECXXXX	Open elective – I	3 (42)	0	0	42	03	03	90	50	50	100	03
5.	HSMC	1BBTA523C	Environmental Studies	1 (14)	0	0	13	02	01	30	50	50	100	01
6.	AEC	1BHSA522C	Quantitative Aptitude and Soft Skills	2 (28)	0	0	26	03	03	60	50	50	100	02
7	Project	1BECA503P	Mini Project	Four Contact Hours/week				03	03	60	50	50	100	02
	PCCL	1BECA504L	Computer Networks Laboratory	0	0	26	00	02	02	30	50	50	100	01
7.	PCCL	1BECA505L	Robotics Laboratory	0	0	26	00	02	02	30	50	50	100	01
8.	PCCL	1BECA506L	Linear Integrated Circuits Laboratory	0	0	26	00	02	02	30	50	50	100	01
9.	MC	1BHSA560M	Yoga	0	0	2	00	02	--	04	100	0	0	0
		1BHBS560M	National Service Scheme (NSS)	0	0	2	00	02	--	04	100	0	0	0
		1BHSC506M	Physical Education (Sports and Athletics)	0	0	2	00	02	--	04	100	0	0	0
	Total			15(210)	0	84	207	32	26	612	800	500	1000	20

VI SEM BE. Scheme of Teaching and Evaluation for 2026-27 Admitted Batch

Sl. No.	Course Category	Course Code	Course Title	Teaching-Learning Scheme				Examination Duration (Hrs/Sem.)		Total Hours	Examination Scheme and Evaluation			Credits (C) =Total Hours/30
				L Hrs/Week (Hrs/Sem.)	T Hrs/Week (Hrs/Sem.)	P Hrs/Week (Hrs/Sem.)	Term Work (TW) and Self Learning (SL) (TW+SL) Hrs/Sem.	CIE	SEE		CIE Marks	SEE Marks	Total Marks	
1.	PCC	1BECA601C	Microwave and Antenna Theory	3 (42)	0	0	42	03	03	90	50	50	100	03
2.	PCC	1BECA602C	Information Theory and Coding	3 (42)	0	0	42	03	03	90	50	50	100	03
3.	PCC	1BECA603C	CMOS Digital VLSI Design	3 (42)	0	0	42	03	03	90	50	50	100	03
4.	PCC	1BECA604C	Optical Fiber Communication	2 (28)	0	0	26	03	03	60	50	50	100	02
5.	AEC	1BHSA600C	Indian Knowledge System	1 (14)	0	0	13	02	01	30	50	50	100	01
6.	PEC	1BECX605E	Professional Elective – II	3 (42)	0	0	42	03	03	90	50	50	100	03
	OEC	1BECXXXN	Open Elective – II	3 (42)	0	0	42	03	03	90	50	50	100	03
7.	PCCL	1BECA605L	CMOS VLSI Design Laboratory	0	0	26	00	02	02	30	50	50	100	01
8	PCCL	1BECA606L	Advanced Communication Laboratory	0	0	26	00	02	02	30	50	50	100	01
9	MC	1BHSA660M	Yoga	0	0	2	00	02	--	04	100	0	0	0
		1BHSB660M	National Service Scheme(NSS)	0	0	2	00	02	--	04	100	0	0	0
		1BHSC660M	Physical Education(PE) (Sports and Athletics)	0	0	2	00	02	--	04	100	0	0	0
	Total			18 (252)	0	58	249	30	23	612	750	450	900	20

VII SEM BE. Scheme of Teaching and Evaluation for 2026-27 Admitted Batch

Sl. No.	Course Category	Course Code	Course Title	Teaching-Learning Scheme				Examination Duration (Hrs/Sem.)		Total Hours	Examination Scheme and Evaluation			Credits (C) =Total Hours/30
				L Hrs/Week (Hrs/Sem.)	T Hrs/Week (Hrs/Sem.)	P Hrs/Week (Hrs/Sem.)	Term Work (TW) and Self Learning (SL) (TW+SL) Hrs/Sem.				CIE Marks	SEE Marks	Total Marks	
								CIE	SEE					
1.	PCC	1BECA701C	Satellite Communication	3 (42)	0	0	42	03	03	90	50	50	100	03
2.	PCC	1BECA702C	Multimedia Communication	3 (42)	0	0	42	03	03	90	50	50	100	03
3.	HSMC	1BECAXXC	Startup and Innovation Ecosystem	3 (42)	0	0	42	03	03	90	50	50	100	03
4.	PEC	1BECX704E	Professional Elective – III	3 (42)	0	0	42	03	03	90	50	50	100	03
5.	PEC	1BECX705E	Professional Elective - IV	3 (42)	0	0	42	03	03	90	50	50	100	03
6.	Project	1BECA706P	Mini Project	Eighteen Contact Hours/week				03	03	60	50	50	100	09
	Total			15(210)	0	0	210	18	18	510	300	300	600	24

VIII SEM BE. Scheme of Teaching and Evaluation for 2026-27 Admitted Batch

Sl. No.	Course Category	Course Code	Course Title	Teaching-Learning Scheme				Examination Duration (Hrs/Sem.)		Total Hours	Examination Scheme and Evaluation			Credits (C) =Total Hours/30
				L Hrs/Week (Hrs/Sem.)	T Hrs/Week (Hrs/Sem.)	P Hrs/Week (Hrs/Sem.)	Term Work (TW) and Self Learning (SL) (TW+SL) Hrs/Sem.				CIE Marks	SEE Marks	Total Marks	
								CIE	SEE					
1.	AEC	1BECXXXXX	MOOCs	3 (42)	0	0	42	03	03	90	50	50	100	03
2.	OEC	1BECXXXXX	MOOCs	3 (42)	0	0	42	03	03	90	50	50	100	03
3.	INT	1BECA803I	Internship	0	0	0	42	03	03	90	50	50	100	10
	Total			06 (84)	0	0	126	09	09	270	150	150	300	16

Professional Elective Courses

Sl. No.	Professional Elective – I		Professional Elective – II		Professional Elective – III		Professional Elective – IV	
	Name of the Course	Course Code	Name of the Course	Course Code	Name of the Course	Course Code	Name of the Course	Course Code
1	Internet of Things and Applications	1BECA503E	Wireless Networks	1BECA605E	Cyber Security	1BECA704E	Industrial IoT	1BECA705E
2	AI for Communication Engineering	1BECB503E	ASIC Design Fundamentals	1BECB605E	Image Processing	1BECB704E	Next Generation Internet Architectures	1BECB705E
3	Robotics and Autofocus Systems	1BECC503E	Edge Computing	1BECC605E	Optical Networks	1BECC704E	Embedded AI Systems	1BECC706E

Open Elective Courses

Sl. No.	Open Elective – I		Open Elective – II	
	Name of the Course	Course Code	Name of the Course	Course Code
1	Automotive Electronics		Real Time Embedded Systems	
2	Micro Electro Mechanical Systems		Wireless Networks and Mobile Architecture	

I/II Year Syllabus



BVV Sangha's
BASAVESHWAR ENGINEERING COLLEGE, BAGALKOTE
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Code		:	1BECA104/204N	Introduction to Electronics & Communication Engineering	Semester	:	I/II
L:T:P		:	3:0:0		Course Type	:	Theory ESC-I
Hours/Sem.	Teaching	:	42 Hrs		CIE Marks	:	50
	Learning (TW+SL)	:	42 Hrs		SEE Marks	:	50
	Exam	:	6 Hrs		Total Marks	:	100
	Total Hrs.	:	90Hrs		Credits	:	03

Professional Competency:

Apply foundational concepts of electronic components, analog and digital circuits, and communication systems to design, analyze, and troubleshoot basic electronic and communication devices.

Course Outcomes:

After completion of the course, student will be able to:

CO1: Differentiate and analyze the applications of electronic devices and circuits.

CO2: Analyze the operation of oscillators, op amps and its applications.

CO3: Analyze different number systems, logic circuits and embedded systems.

CO4: Describe communication system and modulation techniques.

UNIT-I

11Hrs.

Power Supplies: Block diagram, PN junction diode characteristics, half-wave rectifier, full-wave rectifiers and filters, voltage regulators, voltage multipliers. **BJT Characteristics:** Introduction, Common base and common emitter Characteristics. **Self-study component:** Switched mode power supply.

UNIT-II

11Hrs.

Amplifier and Oscillators: Single stage CE amplifier, Barkhausen criterion, sinusoidal and non-sinusoidal oscillators, Ladder network oscillator, Wein bridge oscillator, (Only Concepts, working, and waveforms. No mathematical derivations). **Operational amplifiers:** Ideal op-amp; characteristics of ideal and practical op-amp; Practical op-amp circuits: Inverting and non-inverting amplifiers, voltage follower, summer, integrator, and differentiator. **Self-study component:** Op-amp as zero crossing detectors.

UNIT-III

10Hrs.

Boolean Algebra and Logic Circuits: Binary numbers, number base conversion, octal & hexa decimal numbers, complements, basic definitions, axiomatic definition of Boolean algebra, basic theorems and properties of Boolean algebra, digital logic gates. **Combinational logic:**

Introduction, design procedure, Adders- Half adder, Full adder, Parallel adder. Embedded Systems: Definition, Embedded systems vs general computing systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Elements of an Embedded System, Core of the Embedded System, Microprocessor vs Microcontroller, RISC vs CISC. Self-study component: Half subtractor and full subtractor.	
UNIT-IV	10Hrs.
Communication System: Modern communication system, types of communication systems. Analog Modulation Schemes: Amplitude Modulation, Frequency Modulation (only concepts). Digital Modulation Schemes: Advantages of digital communication over analog communication, ASK, FSK, PSK, radio signal transmission multiple access techniques. Self-study component: Opto-couplers.	
Text Books:	
1. Mike Tooley, "Electronic Circuits, Fundamentals & Applications", Elsevier, 4th Edition, 2015 2. M. Morris Mano, "Digital Logic and Computer Design", PHI Learning, 2008 ISBN-978-81-203-0417-84 3. D. P. Kothari, I. J. Nagrath, "Basic Electronics", McGraw Hill Education (India), 2nd edition, 2018 4. K V Shibu, "Introduction to Embedded Systems", McGraw Hill Education (India), Private Limited, 2nd Edition, 2016 5. S L Kakani and Priyanka Punglia, "Communication Systems", New Age International Publisher, 2017.	
Reference Books:	
1. Robert L. Boylestad, Louis Nashelsky, "Electronic Devices and Circuit Theory", Prentice Hall, 2006. 2. Floyd and Jain, "Digital fundamentals", Pearson, 8th edition, 2006. 3. Jacob Milliman, Christos C. Halkies, "Electronics Devices and Circuits", TMH, 2001	

Course Articulation Matrix

Course Outcomes (COs)	Programme Outcomes (POs) and Wks											Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	1	2	3
CO1	3 (WK1, WK2, WK3, and WK4)	3 (WK1, WK2, WK3, and WK4)	2 (WK5)	-	2 (WK2, and WK6)	2 (WK1)	-	-	-	-	-	3	-	-
CO2	3 (WK1, WK2, WK3, WK4)	2 (WK1, WK2, WK3, and WK4)	3 (WK5)	-	2 (WK6)	1 (WK1)	-	-	-	-	-	3	-	-
CO3	3 (WK1, WK2, WK3 and WK4)	2 (WK2, WK3, and WK4)	3 (WK5)	-	3 (WK2)	-	-	-	1	-	-	3	-	-
CO4	3 (WK1, WK2, and WK3)	1 (WK3, and WK4)	1 (WK1)	-	2 (WK1)	1 (WK1)	-	-	1	-	1	3	-	-

Course Code		:	1BECA205C	Fundamentals of Electronics and Communication Engineering	Semester	:	II
L:T:P		:	3:0:0		Course Type	:	Theory PSC
Hours/Sem.	Teaching	:	42 Hrs		CIE Marks	:	50
	Learning (TW+SL)	:	42 Hrs		SEE Marks	:	50
	Exam	:	6 Hrs		Total Marks	:	100
	Total Hrs.	:	90Hrs		Credits	:	03

Professional Competency:

Demonstrate the ability to apply foundational concepts of electronic components, analog and digital circuits, and communication systems to design, analyze, and troubleshoot basic electronic and communication systems.

Course Outcomes:

After completion of the course, student will be able to:

CO1: Apply the working principles, fundamental characteristics of various semiconductor diodes in basic electronic circuits.

CO2: Analyze the working principles and characteristics of BJT, FET.

CO3: Illustrate the fundamental concepts of operational amplifiers their configurations.

CO4: Design basic combinational circuits using the fundamental principles of digital systems and Analyze the fundamental concepts of communication systems.

UNIT-I

11 Hrs.

Construction, operation and characteristics of PN junction diode, Zener diode, Applications of diodes: Half wave rectifier, Full wave rectifier, Bridge rectifier, rectifier parameters and derivation, Rectifier with capacitor filter, voltage multipliers, Zener diode voltage regulator, and DC power supply.

UNIT-II

11 Hrs.

Bipolar Junction Transistors: Introduction, BJT Voltages & Currents, Common Base Characteristics, Common Emitter Characteristics, Single stage amplifier, RC phase shift oscillator. **Field Effect Transistor:** Junction Field Effect Transistor (N-Channel), JFET Characteristics, MOSFETs: Enhancement MOSFETs, Depletion Enhancement MOSFETs.

UNIT-III

10 Hrs.

Operational Amplifiers: Introduction, The Operational Amplifier, Block Diagram Representation of Typical Op-Amp, Schematic Symbol. Op-Amp Parameters: Gain, Input Resistance, Output Resistance, CMRR, Slew Rate, Bandwidth, and Input Offset Voltage, Input Bias Current and Input Offset Current, The Ideal Op-Amp, Open Loop Op-Amp Configurations: Differential, Inverting & Non Inverting Amplifier. Closed Loop Op-Amp Configurations: Differential, Inverting & Non Inverting Amplifier, Voltage Follower, Summing amplifier, Integrator, Differentiator.

UNIT-IV

10 Hrs.

Number Systems: Introduction, Decimal, Binary, Octal and Hexadecimal Number Systems, Conversion between number systems, Addition and subtraction. **Digital Logic:** Basic Theorems and Properties of Boolean Algebra, Logic Gates, Universal Gates implementation, Half and Full Adder, Parallel Adder.

Fundamentals of Communication: Elements of a Communication System, Modulation: Need for Modulation, Amplitude Modulation, Frequency Modulation, Waveforms. (Excluding Derivation and Spectral Diagrams).

Text Books:

1. David A. Bell, "Electronic Devices and Circuits", 5th edition, Oxford University Press, 30th Impression, 2025.
2. Ramakanth A Gayakwad, Op-amps and Linear Integrated Circuits, 4th Edition, Pearson Education, 2015.
3. M. Morris Mano, "Digital Logic and Computer Design", Pearson Education India, 2017
4. Albert Paul Malvino, David J. Bates, Patrick E. Hoppe, "Electronic Principles", TMH, 9th Edition 2021.

Reference Books:

1. Robert L. Boylestad, Louis Nashelsky, "Electronic Devices and Circuit Theory", 10th Edition Prentice Hall, 2013.
2. Thomas L. Floyd, "Digital fundamentals", 11th edition, Pearson Education India.
3. Jacob Milliman, Christos C. Halkias, "Electronics Devices and Circuits", TMH, 2010

Course Articulation Matrix

Course Outcomes	Programme Outcomes (POs) and WKS											Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	1	2	3
CO1	3 (WK1, WK2, WK3 and WK4)	1	2 (WK5)	3 (WK8)	2 (WK2 and WK6)	1	-	-	-	-	-	3	-	-
CO2	3 (WK1, WK2 WK3 and, WK4)	2 (WK1, WK2, WK3 and WK4)	1 (WK1)	3 (WK8)	2 (WK2 and WK6)	1	-	-	-	-	-	3	-	-
CO3	3 (WK1, WK2 WK3 and, WK4)	1 (WK1)	-	2 (WK8)	-	-	-	-	-	-	-	3	-	-
CO4	3 (WK1, WK2 WK3 and, WK4)	2 (WK1, WK2, WK3 and WK4)	3 (WK5)	2 (WK8)	2 (WK2 and WK6)	1	-	-	-	-	-	3	-	-

Course Code		:	1BECA209L	Fundamentals of Electronics and Communication Engineering Lab	Semester	:	II
L:T:P		:	0:0:2		Course Type	:	Practical (PCCL)
Hours/Sem.	Teaching	:	26 Hrs		CIE Marks	:	50
	Learning (TW+SL)	:	00 Hrs		SEE Marks	:	50
	Exam	:	4Hrs		Total Marks	:	100
	Total Hrs.	:	30Hrs		Credits	:	01

Professional Competency:

Effectively conduct the Fundamentals of Electronics and Communication Engineering Laboratory by guiding students in performing, analyzing, and interpreting experiments on semiconductor devices, rectifiers, transistors and basic digital logic circuits with proper safety and instrumentation practices.

Course Outcomes:

After completion of the course, student will be able to:

CO1: Demonstrate the ability to construct and analyze the V-I characteristics of diodes and BJT.

CO2: Analyze diode-based and transistor-based circuits and measure output parameters.

CO3: Verify the truth tables of logic gates.

CO4: Implement the basic adder/subtractor circuits.

List of Experiments

1. VI-characteristics of a PN junction diode.
2. Study of diode as half-wave and full-wave rectifier (with and without capacitor filter).
3. VI-characteristics of Zener diode.
4. Zener diode as voltage regulator.
5. Study of input and output characteristics of BJT in CE configuration.
6. Truth table verification of logic gates.
7. Implementation of Boolean expression using logic gates.
8. Implementation of half adder and full adder.
9. Implementation of half subtractor and full subtractor.
10. Implementation of parallel adder.

Course Articulation Matrix

Course Outcomes (COs)	Programme Outcomes (POs) and Wks											Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	1	2	3
CO1	3 (WK1, WK2, WK3, WK4)	2 (WK1, WK2, WK3, WK4)	1 (WK1)	2 (WK1, WK2, WK3, WK4)	1 (WK1)	-	-	-	-	-	2 (WK8)	-	-	-
CO2	3 (WK1, WK2, WK3, WK4)	2 (WK1, WK2, WK3, WK4)	3 (WK5)	2 (WK1, WK2, WK3, WK4)	2 (WK6)	-	-	-	-	-	2 (WK8)	-	-	-
CO3	3 (WK1, WK2, WK3, WK4)	2 (WK1, WK2, WK3, WK4)	3 (WK5)	2 (WK1, WK2, WK3, WK4)	2 (WK6)	-	-	-	-	-	1	-	-	-
CO4	3 (WK1, WK2, WK3, WK4)	2 (WK1, WK2, WK3, WK4)	3 (WK5)	2 (WK1, WK2, WK3, WK4)	1 (WK6)	-	-	-	-	-	2 (WK8)	-	-	-