SRI SRINIVASA EDUCATIONAL AND CHARITABLE TRUST

SAPTHAGIRI COLLEGE OF ENGINEERING

(Affiliated to Visvesvaraya Technological University, Belagavi and Approved by AICTE, New Delhi)

(Accredited by NAAC with "A" grade) Accredited by NBA (CSE, ECE, EEE, ISE, ME)

(An ISO 9001:2015 & ISO 14001:2015 Certified)

1.3.2 Number of courses that include experiential learning through project work/field work/internship during the year (2023-24)

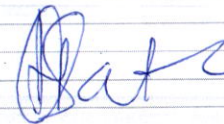| Program Name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course code	Experiential learning details through project work/field work/internship
FIRST YEAR				
Electronics and Communication Engineerir	EC	Basic Electronicsfor EEE stream	BBEE103	Drip Irrigation System
Electronics and Communication Engineerir	EC	Applied Physics for EEE Stream	BPHYE102	Low Power Inverter
Electronics and Communication Engineerir	EC	Introduction to C Programming	BESCK104E	Smart Dustbin
Electronics and Communication Engineerir	EC	Introduction to Internet of Things (IOT)	BETCK105H	Face Recognition Using Python
Electronics and Communication Engineerir	EC	Introduction to Electrical Engineering	BESCK204B	Thermal Detector
Electronics and Communication Engineerir	EC	Introduction to Python Programming	BPLCK205B	Air Pollution Indicator
Electronics and Communication Engineerir	EC			Vehicle Accident Control Project
Electronics and Communication Engineerir	EC			Obstacle Avoiding Robot
Electronics and Communication Engineerir	EC			Nuclear Power Plant
Electronics and Communication Engineerir	EC			Wall Detecting Robot
Electronics and Communication Engineerir	EC			Radar Detection
Electronics and Communication Engineerir	EC			Metal Detectors Using Ic 555 Timer
Electronics and Communication Engineerir	EC			RFID Based Attendance System
Electronics and Communication Engineerir	EC			Ultrasonic Glasses For The Blind.
Electronics and Communication Engineerir	EC			Automatic Fire Extinguisher
Electronics and Communication Engineerir	EC			Fingerprint Door Locking System
Electronics and Communication Engineerir	EC			Vacuum Cleaner Robot
Electronics and Communication Engineerir	EC			Air Cooler
Electronics and Communication Engineerir	EC			Ultrasonic Glass For The Blind Peoples
Electronics and Communication Engineerir	EC			Automatic Fire Extinguisher
Electronics and Communication Engineerir	EC			Solar Tracker
Electronics and Communication Engineerir	EC			Magnetic Suspension System
Electronics and Communication Engineerir	EC			IR Proximity Sensor
Electronics and Communication Engineerir	EC			Laser Security Alarm
Electronics and Communication Engineerir	EC			Phone Signal Detector
Electronics and Communication Engineerir	EC			Home Automation
Electronics and Communication Engineerir	EC			Automatic Rainfall Detector
Electronics and Communication Engineerir	EC			Wireless Power Transmission
Electronics and Communication Engineerir	EC			Water Level Controller
SECOND YEAR				
Electronics and Communication Engineerir	EC	Digital SystemDesignusingVerilog	BEC302	RFID
Electronics and Communication Engineerir	EC	ElectronicPrinciplesandCircuits	BEC303	Mini FM transmission system
Electronics and Communication Engineerir	EC	AnalogandDigital SystemsDesignLab	BECL305	Dc motor speed controller using 555 timer
Electronics and Communication Engineerir	EC	ComputerOrganizationandArchitecture	BEC306C	Radar system

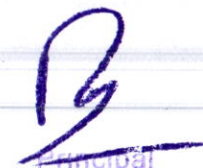|				
Electronics and Communication Engineerir	EC	IOTforSmartInfrastructure	BEC358D	Vehicle movement based street light project
Electronics and Communication Engineerir	EC	PrinciplesofCommunicationSystems	BEC402	Patient health monitoring system
Electronics and Communication Engineerir	EC	CommunicationLab	BECL404	Walking Charger Using Piezoelectric transducer
Electronics and Communication Engineerir	EC	Microcontroller	BEC405A	Radar using aurdino and ultrasonic sensor
Electronics and Communication Engineerir	EC	Microcontroller Lab	BECL456A	Speed control DC motor using aurdino
Electronics and Communication Engineerir	EC			Automated Dam Control System
Electronics and Communication Engineerir	EC			Automatic breaking vehicle
Electronics and Communication Engineerir	EC			Radar System
Electronics and Communication Engineerir	EC			Traffic Light Circuit Using 555 Timer IC
Electronics and Communication Engineerir	EC			Traffic ght Circuit Using |555 Timer IC
Electronics and Communication Engineerir	EC			Turbidity sensor
Electronics and Communication Engineerir	EC			Line following robot
Electronics and Communication Engineerir	EC			Automatic breaking vehicle
Electronics and Communication Engineerir	EC			Pet controller
Electronics and Communication Engineerir	EC			LPG Gas detector
Electronics and Communication Engineerir	EC			Mini Audio Amplifier
Electronics and Communication Engineerir	EC			Working of Audio Amplifier
Electronics and Communication Engineerir	EC			Simple clap switch circuit for Home Automation
Electronics and Communication Engineerir	EC			LPG Gas Leakage Detector
Electronics and Communication Engineerir	EC			Cell phone signal Booster
Electronics and Communication Engineerir	EC			Smart Pet Feeder
Electronics and Communication Engineerir	EC			Clap Switch
Electronics and Communication Engineerir	EC			Metal Detector
Electronics and Communication Engineerir	EC			Energy Generator with Magnet and Motor
Electronics and Communication Engineerir	EC			Automatic Fire Extinguisher
Electronics and Communication Engineerir	EC			Fire Extinguisher
Electronics and Communication Engineerir	EC			Door Security alarm
Electronics and Communication Engineerir	EC			Solar Tracking System
Electronics and Communication Engineerir	EC			Mini Audio Amplifier
Electronics and Communication Engineerir	EC			Ultrasonic Radar System
Electronics and Communication Engineerir	EC			Audio Amplifier
Electronics and Communication Engineerir	EC			Automatic Fire Extinguisher
Electronics and Communication Engineerir	EC			Automatic Fire Extinguisher
Electronics and Communication Engineerir	EC			Solar Mobile Charger
THIRD YEAR				
Electronics and Communication Engineerir	EC	DigitalCommunication	BSC 21EC51	Modified Synchronisation Of Audio And Lyrics Using Arduino
Electronics and Communication Engineerir	EC	ComputerOrganization& ARM Microcontroller	IPCC 21EC52	Electronic Voting Machine (Evm)
Electronics and Communication Engineerir	EC	CommunicationLabII	PCC 21ECL55	LiFi
Electronics and Communication Engineerir	EC	IoT(InternetofThings)Lab	21EC581	Obstacle Avoidance, Bluetooth And Voice Control Arduino Robot
Electronics and Communication Engineerir	EC	VLSIDesign&Testing	PCC 21EC63	Advanced Driver Sleep Detection System
Electronics and Communication Engineerir	EC	Python Programming	PEC 21EC643	Autonavigation Using Ros2
Electronics and Communication Engineerir	EC	VLSILaboratory	PCC 21ECL66	Lifi Based Communication
Electronics and Communication Engineerir	EC	MiniProject	MP21ECMP67	Water Management System For Agriculture
Electronics and Communication Engineerir	EC			Zero Contact Tachometer

Electronics and Communication Engineerir	EC			Inventory Management System
Electronics and Communication Engineerir	EC			Arduino Bluetooth Controller Car
Electronics and Communication Engineerir	EC			Patient Health Database Management
Electronics and Communication Engineerir	EC			Heart Rate Monitoring System
Electronics and Communication Engineerir	EC			Heart Pulse Sensor Using Arduino
Electronics and Communication Engineerir	EC			Offline Home Automation
Electronics and Communication Engineerir	EC			Third Eye For Blind People
Electronics and Communication Engineerir	EC			Artificial Intelligence
Electronics and Communication Engineerir	EC			Deep Fake Detection
Electronics and Communication Engineerir	EC			Arduino Based Traffic Congestion Control With
Electronics and Communication Engineerir	EC			Xml,Java, Python
Electronics and Communication Engineerir	EC			Smart Energy Meter
Electronics and Communication Engineerir	EC			Weather Station Using Esp-12e
Electronics and Communication Engineerir	EC			Phone Jammer Using Multisim
Electronics and Communication Engineerir	EC			Smart Blood Oxygen And Heart Rate Monitor With Automatic Data Saving System
Electronics and Communication Engineerir	EC			Vehicle Accident Detection And Tracking System
Electronics and Communication Engineerir	EC			Iot Based Health Monitoring System
Electronics and Communication Engineerir	EC			Landmark Detection With Ml
Electronics and Communication Engineerir	EC			Automatic Lap Time Measurement System
Electronics and Communication Engineerir	EC			Project Of Iot
Electronics and Communication Engineerir	EC			Fastest Finger First Circuit Using 555 Ic For Organizing Quizzes
FOURTH YEAR				
Electronics and Communication Engineerir	EC	VLSI Design	18EC72	Home Automation for disabled people using Voice Tag
Electronics and Communication Engineerir	EC	Multimedia Communiction	18EC743	Advanced IOT and Machine learning Solutions to Monitor Underpass water logging
Electronics and Communication Engineerir	EC	Machine Learning with PYTHON	18EC745	Automated wildlife surveillance robot using Android
Electronics and Communication Engineerir	EC	Computer Networks Lab	18ECL76	Surveillance Robot for military application using IOT
Electronics and Communication Engineerir	EC	VLSI Lab	18ECL77	Parking LOT management system
Electronics and Communication Engineerir	EC	Project Work Phase - 1	18ECP78	IOT based non intrusive automated driver drowsiness monitoring framework for logistics
Electronics and Communication Engineerir	EC	Wireless and Cellular Communication	18EC81	IOT based air quality monitoring system using LORa
Electronics and Communication Engineerir	EC	Project work	18ECP83	Gas Leakage detection and automatic gas booking using IOT
Electronics and Communication Engineerir	EC	Technical Seminar	18ECS84	Rasberry Pi based hand Gesture recognition and Voice conversion system
Electronics and Communication Engineerir	EC	Internship	18ECI85	Design and implementation of compact 8T SRAM cell with enhanced read and write stability
Electronics and Communication Engineerir	EC			GPS Guided River cleaning Robot
Electronics and Communication Engineerir	EC			Smart anti-Theft system for home security using image processing
Electronics and Communication Engineerir	EC			Railway Management system using IOT
Electronics and Communication Engineerir	EC			Iot based school bus monitoring
Electronics and Communication Engineerir	EC			Authenticated Access control for vehicle Ignition system by DL and Fingerprint technology
Electronics and Communication Engineerir	EC			Smart speed Guardian: An Intelligent Bike speed Monitoring and control system
Electronics and Communication Engineerir	EC			Anywhere voting system with facial Recognition using IOT
Electronics and Communication Engineerir	EC			Iot platform totree as smart highway street light with ambient monitoring capability augment solar
Electronics and Communication Engineerir	EC			Automatic Sorting of fruit placed on conveyor belt
Electronics and Communication Engineerir	EC			Smart Glove for sign language translation using Arduino
Electronics and Communication Engineerir	EC			monitoring system for infantsLI-FI based
Electronics and Communication Engineerir	EC			CNN based object recognition and tracking system to assist visually impaired people

Electronics and Communication Engineerin	EC			Smart phone surveillance based on Rasberry pi
Electronics and Communication Engineerin	EC			Design and implementation of CMOS differential LNA for wireless communication using 180 mm
Electronics and Communication Engineerin	EC			Prediction of epilepsy seizures by Machine learning Methods
Electronics and Communication Engineerin	EC			IoT based forest fire detection and animal detection
Electronics and Communication Engineerin	EC			Autonoumus Radar based surveillance and emergency alert system
Electronics and Communication Engineerin	EC			Development of remotedly operated under water vehicle
Electronics and Communication Engineerin	EC			Gesture controlled audio system
Electronics and Communication Engineerin	EC			Railway track detection and srveillance

HOD, Dept. of ECE

Head of the Department
Electronics & Communication
Sapthagiri College of Engineering
Bangalore - 560 057

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SchemeofTeaching andExaminations-2022
Outcome-Based Education(OBE)andChoiceBasedCreditSystem(CBCS)
(Effectivefromtheacademicyear 2022-23)

ISemester(Electrical & Electronics EngineeringStream)   **(For Physics Group)**

Sl. No	Course andCourseCode		CourseTitle	TD/PSB	Theory Lecture (L)	Tutorial (T)	Practical/ Drawing (P)	SDA (S)	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
1	*ASC(IC)	BMATE101	**Mathematics-I** for EEE Streams	Maths	2	2	2	0	03	50	50	100	04
2	#ASC(IC)	BPHYE102	**Applied Physics** for EEE Stream	PHY	2	2	2	0	03	50	50	100	04
3	ESC	BEEE103	**# Elements**of Electrical Engineering	EEE/ECE/TCE	2	2	0	0	03	50	50	100	03
			OR		OR								
		BBEE103	**## Basic Electronics**for EEE stream		3	0	0	0					
4	ESC-I	BESCK104x	Engineering Science Course-I	Respective Engg Dept	3	0	0	0	03	50	50	100	03
5	ETC-I	BETCK105x	Emerging Technology Course-I	Any Dept	3	0	0	0	03	50	50	100	03
			OR										
	PLC-I	BPLCK105x	Programming Language Course-I		2	0	2	0	03				
6	AEC	BENGK106	Communicative English	Humanities	1	0	0	0	01	50	50	100	01
			OR										
		BPWSK106	Professional Writing Skills in English										
7	HSMC	BKSKK107/ BKBKK107	Samskrutika Kannada/ Balake Kannada	Humanities	1	0	0	0	01	50	50	100	01
			OR										
		BICOK107	Indian Constitution		1	0	0	0					
8	AEC/SDC	BIDTK158	Innovation and Design Thinking	Any Dept	1	0	0	0	01	50	50	100	01
			OR										
		BSFHK158	Scientific Foundations of Health		1	0	0	0	01				

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shall be designed as an Integrated course (L:T:P:S= 2:0:2:0),. **All 01 Credit-** courses shall have the SEE of 01 hours duration and the pattern of the question paper shall be MCQ

(ESC-I) Engineering Science Courses-I					(ETC-I) Emerging Technology Courses-I				
Code	**Title**	**L**	**T**	**P**	**Code**	**Title**	**L**	**T**	**P**
BESCK104A	Introduction to Civil Engineering	3	0	0	BETCK105A	Smart Materials and Systems	3	0	0
BESCK104B	Introduction to Electrical Engineering	3	0	0	BETCK105B	Green Buildings	3	0	0
BESCK104C	Introduction to Electronics Communication	3	0	0	BETCK105C	Introduction to Nano Technology	3	0	0
BESCK104D	Introduction to Mechanical Engineering	3	0	0	BETCK105D	Introduction to Sustainable Engineering	3	0	0
BESCK104E	Introduction to C Programming	2	0	2	BETCK105E	Renewable Energy Sources	3	0	0
					BETCK105F	Waste Management	3	0	0
					BETCK105G	Emerging Applications of Biosensors	3	0	0
					BETCK105H	Introduction to Internet of Things (IOT)	3	0	0
					BETCK105I	Introduction to Cyber Security	3	0	0
					BETCK105J	Introduction to Embedded System	3	0	0

(PLC-I) Programming Language Courses-I				
Code	**Title**	**L**	**T**	**P**
BPLCK105A	Introduction to Web Programming	2	0	2
BPLCK105B	Introduction to Python Programming	2	0	2
BPLCK105C	Basics of JAVA programming	2	0	2
BPLCK105D	Introduction to C++ Programming	2	0	2

The course BESCK104E, Introduction to C Programming, and all courses under PLC and ETC groupscan be taught by faculty of ANY DEPARTMENT

- The student has to select one course from the ESC-I group.
- **EEE** Students shall opt for any one of the courses from the ESC-I group **except, BESCK104B-Introduction to Electrical Engineering** and **ECE/ETC/BM/ML** students shall opt any one of the courses from ESC-I **except BESCK104C Introduction to Electronics** Engineering
- The students have to opt for the courses from ESC group without repeating the course in either 1st or 2nd semester
- The students must select one course from either ETC-I or PLC-I group.
- If students study the subject from ETC-I in 1st semester he/she has to select the course from PLC-II in the 2nd semester and vice-versa

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(ESC-II) Engineering Science Courses-II					(ETC-II) Emerging Technology Courses-II				
Code	Title	L	T	P	Code	Title	L	T	P
BESCK204A	Introduction to Civil Engineering	3	0	0	BETCK205A	Smart materials and Systems	3	0	0
BESCK204B	Introduction to Electrical Engineering	3	0	0	BETCK205B	Green Buildings	3	0	0
BESCK204C	Introduction to Electronics **Communication**	3	0	0	BETCK205C	Introduction to Nano Technology	3	0	0
BESCK204D	Introduction to Mechanical Engineering	3	0	0	BETCK205D	Introduction to Sustainable Engineering	3	0	0
BESCK204E	Introduction to C Programming	2	0	2	BETCK205E	Renewable Energy Sources	3	0	0
					BETCK205F	Waste Management	3	0	0
					BETCK205G	Emerging Applications of Biosensors	3	0	0
					BETCK205H	Introduction to Internet of Things(IoT)	3	0	0
					BETCK205I	Introduction to Cyber Security	3	0	0
					BETCK205J	Introduction to Embedded System	3	0	0

(PLC-II) Programming Language Courses-II				
Code	Title	L	T	P
BPLCK205A	Introduction to Web Programming	2	0	2
BPLCK205B	Introduction to Python Programming	2	0	2
BPLCK205C	Basics of JAVA programming	2	0	2
BPLCK205D	Introduction to C++ Programming	2	0	2

The course BESCK204E, **Introduction to C Programming, and all courses under PLC and ETC groupscan be taught by faculty of ANY DEPARTMENT**

- The student has to select one course from the ESC-II group.
- **EEE** Students shall opt for any one of the courses from the ESC-I group **except,** BESCK204B-**Introduction to Electrical Engineering and ECE/ETC/BM/ML** students shall opt any one of the courses from ESC-I **except** BESCK204CIntroduction to Electronics Engineering
- The students have to opt for the courses from ESC group without repeating the course in either 1st or 2nd semester
- The students must select one course from either ETC-II or PLC-II group.
- If students study the subject from ETC-I in 1st semester he/she has to select the course from PLC-II in the 2nd semester and vice-versa

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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)

III SEMESTER

Sl. No	Course	Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Theory Lecture L	Tutorial T	Practical/ Drawing P	SDA S	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
1	PCC	BMATEC301	AV Mathematics-III for EC Engineering	TD- Maths PSB - Maths	3	0	0		03	50	50	100	3
2	IPCC	BEC302	Digital System Design using Verilog	TD: ECE PSB: ECE	3	0	2		03	50	50	100	4
3	IPCC	BEC303	Electronic Principles and Circuits	TD: ECE PSB: ECE	3	0	2		03	50	50	100	4
4	PCC	BEC304	Network Analysis	TD: ECE PSB: ECE	3	0	0		03	50	50	100	3
5	PCCL	BECL305	Analog and Digital Systems Design Lab	TD: ECE PSB: ECE	0	0	2		03	50	50	100	1
6	ESC	BXX306x	ESC/ETC/PLC	TD: PSB:	3	0	0		03	50	50	100	3
7	UHV	BSCK307	Social Connect and Responsibility	Any Department	0	0	2		01	100	---	100	1
8	AEC/ SEC	BXX358x	Ability Enhancement Course/Skill Enhancement Course– III		If the course is a Theory				01	50	50	100	1
					1	0	0						
					If a course is a laboratory				02				
					0	0	2						
9	MC	BNSK359	National Service Scheme (NSS)	NSS coordinator	0	0	2			100	---	100	0
		BPEK359	Physical Education (PE) (Sports and Athletics)	Physical Education Director									
		BYOK359	Yoga	Yoga Teacher									
					Total					550	350	900	20

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: Semester End Evaluation.K :This letter in the course code indicates common to all the stream of engineering. ESC: Engineering Science Course, ETC: Emerging

JBOS 10.02.2023 / V5

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Technology Course, PLC: Programming Language Course

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

Professional Core Course (IPCC): Refers to Professional Core Course Theory Integrated with practical's 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 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 the Degree of Bachelor of Engineering /Technology (B.E./B.Tech.) 2022-23 may please be referred.

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 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 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 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.

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IV SEMESTER

Sl. No	Course and Course Code		Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination					Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Self -Study	Duration in hours	CIE Marks	SEE Marks	Total Marks		
					L	T	P	S						
1	PCC	BEC401	Electromagnetics Theory	TD: ECE /ETE PSB: ECE/ETE	3	0	0		03	50	50	100		3
2	IPCC	BEC402	Principles of Communication Systems	TD: ECE /ETE PSB: ECE/ETE	3	0	2		03	50	50	100		4
3	IPCC	BEC403	Control Systems	TD: ECE /ETE PSB: ECE/ETE	3	0	2		03	50	50	100		4
4	PCCL	BECL404	Communication Lab	TD: ECE /ETE PSB: ECE/ETE	0	0	2		03	50	50	100		1
5	ESC	BEC405x	ESC/ETC/PLC	TD: ECE /ETE PSB: ECE/ETE	3	0	0		03	50	50	100		3
6	AEC/ SEC	BXX456x	Ability Enhancement Course/Skill Enhancement Course- IV	TD and PSB: Concerned department	If the course is Theory				01	50	50	100		1
					1	0	0							
					If the course is a lab				02					
					0	0	2							
4	BSC	BBOK407	Biology For Engineers	TD / PSB: BT, CHE,	3	0	0		03	50	50	100		3
7	UHV	BUHK408	Universal human values course	Any Department	1	0	0		01	50	50	100		1
9	MC	BNSK459	National Service Scheme (NSS)	NSS coordinator	0	0	2			100	---	100		0
		BPEK459	Physical Education (PE) (Sports and Athletics)	Physical Education Director										
		BYOK459	Yoga	Yoga Teacher										
									Total	500	400	900		20
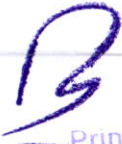
JBOS 10.02.2023 / V5

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

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

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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)

V SEMESTER

Sl. No	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Theory Lecture (L)	Tutorial (T)	Practical/ Drawing (P)	Self -Study (S)	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
1	BSC 21EC51	Digital Communication	TD: ECE PSB: ECE	3	0	0	1	03	50	50	100	3
2	IPCC 21EC52	Computer Organization & ARM Microcontroller	TD: ECE, CSE PSB: ECE	3	0	2		03	50	50	100	4
3	PCC 21EC53	Computer Communication Networks	TD: ECE PSB: ECE	3	0	0	1	03	50	50	100	3
4	PCC 21EC54	Electromagnetics Waves	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
8	AEC 21EC58X	Ability Enhancement Course-V	Concerned Board	If offered as Theory courses				01	50	50	100	1
				1	0	0						
				If offered as lab. courses				02				
				0	0	2						
								Total	400	400	800	18
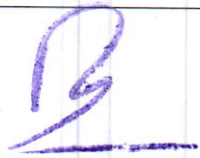
Ability Enhancement Course - V

21EC581	IoT (Internet of Things) Lab	21EC583	Java Programming
21EC582	Communication Simulink Toolbox	21EC584	Data Structures Using C++

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.

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VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
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)

VI SEMESTER

Sl. No	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Theory Lecture (L)	Tutorial (T)	Practical/ Drawing (P)	Self-Study (S)	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
1	HSMC 21EC61	Technological Innovation Management and Entrepreneurship	Any Department	3	0	0	0	03	50	50	100	3
2	IPCC 21EC62	Microwave Theory & Antennas	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	Two contact hours /week for interaction between the faculty and students.					--	100	--	100	2
8	INT 21INT68	Innovation/Entrepreneurship /Societal Internship	Completed during the intervening period of IV and V semesters.					--	100	--	100	3
							Total		500	300	800	22

Professional 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 Department to other Department students

21EC651	Communication Engineering (L:T:P :: 3:0:0)		21EC653	Basic VLSI Design (L:T:P :: 3:0:0)
21EC652	Microcontrollers (L:T:P :: 3:0:0)		21EC654	Electronic Circuits with Verilog (L:T:P :: 2:0:2)
21EC655	Sensors & Actuators (L:T:P :: 3:0:0)			

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.

In case, any college is desirous of offering a course (not included in the Open Elective List of the University) from streams such as Law, Business

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(MBA), 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.

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VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2018 – 19)

Programme: B.E: Electronics & Communication Engineering

VII SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	PCC	18EC71	Computer Networks		3	--	--	03	40	60	100	3
2	PCC	18EC72	VLSI Design		3	--	--	03	40	60	100	3
3	PEC	18XX73X	Professional Elective - 2		3	--	--	03	40	60	100	3
4	PEC	18XX74X	Professional Elective - 3		3	--	--	03	40	60	100	3
5	OEC	18XX75X	Open Elective -B		3	--	--	03	40	60	100	3
6	PCC	18ECL76	Computer Networks Lab		--	2	2	03	40	60	100	2
7	PCC	18ECL77	VLSI Laboratory		--	2	2	03	40	60	100	2
8	Project	18ECP78	Project Work Phase - 1		--	--	2	--	100	--	100	1
9	Internship	--	Internship	(If not completed during the vacation of VI and VII semesters, it shall be carried out during the vacation of VII and VIII semesters)								
			TOTAL		15	04	06	21	38	420	800	20

Note: PCC: Professional core, PEC: Professional Elective.

Professional Elective - 2

Course code under 18XX73X	Course Title
18EC731	Real Time Systems
18EC732	Satellite Communication
18EC733	Digital Image Processing
18EC734	DSP Algorithms & Architecture

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Course code under 18XX74X	Course Title
18EC741	IOT & Wireless Sensor Networks
18EC742	Automotive Electronics
18EC743	Multimedia Communication
18EC744	Cryptography
18EC745	Machine Learning with Python
Open Elective –B	
18EC751	Communication Theory
18EC752	Neural Networks
18EC753	**ARM Embedded Systems**
18EC754	**Digital Systems Design using VHDL**

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.

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

Programme: B.E: Electronics & Communication Engineering

VIII SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Theory Lecture (L)	Tutorial (T)	Practical/ Drawing (P)	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
1	PCC	18EC81	Wireless and Cellular Communication		3	--	--	03	40	60	100	3
2	PEC	18XX82X	Professional Elective - 4		3	--	--	03	40	60	100	3
3	Project	18ECP83	Project Work Phase - 2		--	--	2	03	40	60	100	8
4	Seminar	18ECS84	Technical Seminar		--	--	2	03	100	--	100	1
5	Internship	18ECI85	Internship	Completed during the vacation/s of VI and VII semesters and /or VII and VIII semesters.)				03	40	60	100	3
			TOTAL		06	--	04	15	260	240	500	18

Note: PCC: Professional Core, PEC: Professional Elective.

Professional Elective - 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

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Project Work

CIE 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.

SEE for Project Work Phase - 2:

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

(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 belongs 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).

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