SRI SRINIVASA EDUCATIONAL AND CHARITABLE
SAPTHAGIRI COLLEGE OF ENGINEERING
(Affiliated to Visvesvaraya Technological University, Belagavi and Approved by AICTE, New De...
(Accredited by NAAC with "A" grade) Accredited by NBA (CSE, ECE, EEE, ISE, ME)
(An ISO 9001:2015 & ISO 14001:2015 Certified)

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
Electrical and Electronics Engineering	EE	Mathematics for EEE Streams-I	BMATE101	MORSE code signal generator
Electrical and Electronics Engineering	EE	Elements of Electrical Engineering	BEEE103	Rain water detector
Electrical and Electronics Engineering	EE	Applied Physics for EEE Stream	BPHYE102	Clap switch
Electrical and Electronics Engineering	EE	Introduction to C Programming	BESCK104E	Stress meter
Electrical and Electronics Engineering	EE	Introduction to Internet of Things (IOT)	BETCK105H	Smart irrigation system
Electrical and Electronics Engineering	EE	Mathematics for EEE Stream-II	BMATE201	Hydro electric generator
Electrical and Electronics Engineering	EE	Chemistry for EEE Stream	BCHEE202	Automatic street light
Electrical and Electronics Engineering	EE	Introduction to Electronics Engineering	BESCK204C	LDR light sensor
Electrical and Electronics Engineering	EE	Introduction to Python Programming	BPLCK205B	Alcohol sensing alert with engine locking system
Electrical and Electronics Engineering	EE			Fire alarm detector
Electrical and Electronics Engineering	EE			Solar panel
Electrical and Electronics Engineering	EE			Inverter with solar charging
Electrical and Electronics Engineering	EE			Controlling a DC motor using MOSFET
Electrical and Electronics Engineering	EE			Land mine detector
Electrical and Electronics Engineering	EE			Water level indicator
Electrical and Electronics Engineering	EE	Analog Electronics circuits and op-amp's	21EE32	Password based circuit breaker using 8051 microcontroller.
Electrical and Electronics Engineering	EE	Electric Circuit Analysis	21EE33	Fire Fighting Robot
Electrical and Electronics Engineering	EE	Transformers and Generators	21EE34	Ultrasonic Radar system using 8051 Microcontroller
Electrical and Electronics Engineering	EE	Electrical machines Lab-1	21EEEL35	Digital clock using 8051 Microcontroller.
Electrical and Electronics Engineering	EE	SCILAB for Transformers and Generators	21EEL381	Traffic light controller using 8051 microcontroller
Electrical and Electronics Engineering	EE	Digital System Design	21EE42	Toll tax system using Microcontroller
Electrical and Electronics Engineering	EE	Microcontroller	21EE43	Range finder using Microcontroller
Electrical and Electronics Engineering	EE	Electric motors	21EE44	Temperature controlled fan using 8051
Electrical and Electronics Engineering	EE	Electrical machines Lab-2	21EEL46	Lane grass cutter
Electrical and Electronics Engineering	EE	Microcontroller based mini-project	21EEP481	Weather station monitoring system using microcontroller
Electrical and Electronics Engineering	EE			Controlling light using touch sensor and range sensor
Electrical and Electronics Engineering	EE			Heart beat monitor with pulse sensor
Electrical and Electronics Engineering	EE			RFID door lock system
Electrical and Electronics Engineering	EE			Anti-sleep alarm project for drivers using microcontrollers
Electrical and Electronics Engineering	EE			Railway accident prevention.
Electrical and Electronics Engineering	EE			Smart dustbin
Electrical and Electronics Engineering	EE			Smoke detector using 8051 microcontroller
Electrical and Electronics Engineering	EE			Automatic irrigation system

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Electrical and Electronics Engineering	EE			Density based traffic signal system using microcontroller
Electrical and Electronics Engineering	EE			Automatic room lighting system
Electrical and Electronics Engineering	EE			Robot vacuum cleaner
Electrical and Electronics Engineering	EE			Student SMS n biometric attendance system
Electrical and Electronics Engineering	EE			Home automation
Electrical and Electronics Engineering	EE			DC motor speed control using 8051 microcontroller
Electrical and Electronics Engineering	EE			Wireless red signal alerting for trains
Electrical and Electronics Engineering	EE			Water level monitoring system

Electrical and Electronics Engineering	EE	Microcontroller	18EE52	Medicine alarm
Electrical and Electronics Engineering	EE	Power Electronics	18EE53	Speed Control of Induction Motor
Electrical and Electronics Engineering	EE	Signals and Systems	18EE54	Inverter using transistor.
Electrical and Electronics Engineering	EE	Electrical Machine Design	18EE55	Smart parking solution
Electrical and Electronics Engineering	EE	High Voltage Engineering	18EE56	Arduino based fire detection and system.
Electrical and Electronics Engineering	EE	Microcontroller Laboratory	18EEL57	Computer Numerical Control (CNC)
Electrical and Electronics Engineering	EE	Power Electronics Laboratory	18EEL58	Temperature Controlled fan using Arduino
Electrical and Electronics Engineering	EE	Control Systems	18EE61	Medicine alarm
Electrical and Electronics Engineering	EE	Power system Analysis-1	18EE62	Speed Control of Induction Motor
Electrical and Electronics Engineering	EE	Digital Signal Processing	18EE63	Inverter using transistor.
Electrical and Electronics Engineering	EE	Computer Aided Electrical Drawing	18EE643	Smart parking solution
Electrical and Electronics Engineering	EE	Sensors and Transducers	18EE647	Arduino based fire detection and system.
Electrical and Electronics Engineering	EE	Control System Laboratory	18 EEL66	Computer Numerical Control (CNC)
Electrical and Electronics Engineering	EE	Digital Signal Processing Laboratory	18 EEL67	Temperature Controlled fan using Arduino
Electrical and Electronics Engineering	EE	Mini-project	18EEMP68	

Electrical and Electronics Engineering	EE	Power system Analysis-2	18EE71	Drive for Switch Reluctance Motor
Electrical and Electronics Engineering	EE	Power System Protection	18EE72	Women safety night patrolling robot
Electrical and Electronics Engineering	EE	Integrated of Distribution Generation.	18EE733	Design, construction of a solar tracking system and comparison over conventional stationary solar panel system
Electrical and Electronics Engineering	EE	Utilization of Electrical Power	18EE742	Zigbee based wireless home security system
Electrical and Electronics Engineering	EE	Electric Vehicles	18EE752	DTMF Controlled Stair Climbing Robot
Electrical and Electronics Engineering	EE	Electrical Energy Conservation and Auditin	18EE754	Smart spying robot with vision (solider alive detection, smoker bomb detection and health monitoring)
Electrical and Electronics Engineering	EE	PSS laboratory	18EEL76	Fault detection of electrical equipment's using artificial intelligence.
Electrical and Electronics Engineering	EE	Relay & HV lab	18EEL77	A new IOT gateway for Artificial intelligence in Agriculture.
Electrical and Electronics Engineering	EE	Project Work Phase - 1	18EEP78	Iot based automated parlysis patient health care system using Arduino.
Electrical and Electronics Engineering	EE	Power System Operation and Control	18EE81	Centralized Automation of Petrol bunk management and safety using RFID.
Electrical and Electronics Engineering	EE	Electrical Estimation and Costing	18EE822	Greenhouse monitoring and controlling using Android mobile application.
Electrical and Electronics Engineering	EE	Power System Planning	18EE824	Efficiency Enhancement of wind turbine using MAGLEV TECHNIQUE
Electrical and Electronics Engineering	EE	Project Work Phase - 2	18EEP83	Embedded based vehicle accident detection and rescue system
Electrical and Electronics Engineering	EE	Technical Seminar	18EES84	The Eye-Gaze Technology
Electrical and Electronics Engineering	EE	Internship	18EEI85	Biometrically Secured ATM Vigilance System
Electrical and Electronics Engineering	EE	Internship	18EEI85	Programmable bionic arm
Electrical and Electronics Engineering	EE			Automatic detection and notification of speed breakers and pathole using global positioning system
Electrical and Electronics Engineering	EE			Induction motor speed control using spartan6 FPGA Kit
Electrical and Electronics Engineering	EE			An efficient G2V and V2G converter system for EV applications
Electrical and Electronics Engineering	EE			Gas Leakage with Auto Ventilation and Smart Management System Using IoT

Electrical and Electronics Engineering	EE			Incorporating Residential Smart Electric Vehicle Charging in Home Energy Management Systems
Electrical and Electronics Engineering	EE			Eco-friendly 3D printer
Electrical and Electronics Engineering	EE			Battery management system
Electrical and Electronics Engineering	EE			A high powered Switch Mode Power Supply with short circuit Protection

HOD, EEE

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(Effectivefromtheacademicyear 2022-23)

I Semester(Electrical & Electronics Engineering Stream)   **(For Physics Group)**

Sl. No	Course and CourseCode		CourseTitle	TD/PSB	Teaching Hours/Week				Examination					Credits
					Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks		
					L	T	P	S						
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					

						TOTAL						400	400	800	20

 # Electrical & Electronics Engineering Students have to study BEEE103- Element of Electrical Engineering compulsorily
Where as Electronics and allied stream students have to study BBEE103 Basic Electronics compulsorily

SDA-Skill Development Activities, TD/PSB- Teaching Department / Paper Setting Board, ASC-Applied Science Course, ESC- Engineering Science Courses, ETC-Emerging Technology Course, AEC- Ability Enhancement Course, HSMS-Humanity and Social Science and Management Course, SDC- Skill Development Course, CIE–Continuous Internal Evaluation, SEE- Semester End Examination, IC – Integrated Course (Theory Course Integrated with Practical Course)

Credit Definition:	
1-hour Lecture (L) per week=1Credit	04-Credits courses are to be designed for 50 hours of Teaching-Learning Session
2-hoursTutorial(T) per week=1Credit	04-Credits (IC) are to be designed for 40 hours' theory and 12-14 hours of practical sessions
2-hours Practical / Drawing (P) per week=1Credit	03-Credits courses are to be designed for 40 hours of Teaching-Learning Session
2-hous Skill Development Actives (SDA) per week = 1 Credit	02- Credits courses are to be designed for 25 hours of Teaching-Learning Session
	01-Credit courses are to be designed for 12-15 hours of Teaching-Learning sessions

Student's Induction Program: Motivating (Inspiring) Activities under the Induction program – The main aim of the induction program is to provide newly admitted students a broad understanding of society, relationships, and values. Along with the knowledge and skill of his/her study, students' character needs to be nurtured as an essential quality by which he/she would understand and fulfill the responsibility as an engineer. The following activities are to be covered in 21 days. Physical Activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to Local areas, Familiarization with Department/Branch and Innovation, etc. For details, refer the ANNEXURE-I of Induction Programs notification of the University published at the beginning of the 1st semester.

AICTE Activity Points to be earned by students admitted to BE/ B.Tech., / B. Plan day college program (For more details refer to Chapter 6, AICTE Activity Point Program, Model Internship Guidelines): Over and above the academic grades, every regular student admitted to the 4 years Degree program and every student entering 4 years Degree programs through lateral entry, shall earn 100 and 75 Activity Points respectively for the award of degree through AICTE Activity Point Program. Students transferred from other Universities to the fifth semester are required to earn 50 Activity Points from the year of entry to VTU. The Activity Points earned shall be reflected on the student's eighth semester Grade Card. The activities can be spread over the years, any time during the semester weekends, and holidays, as per the liking and convenience of the student from the year of entry to the program. However, the minimum hours requirement should be fulfilled. Activity Points (non-credit) do not affect SGPA/CGPA and shall not be considered for vertical progression. In case students fail to earn the prescribed activity Points, an Eighth Semester Grade Card shall be issued only after earning the required activity points. Students shall be admitted for the award of the degree only after the release of the Eighth semester Grade Card.

*- BMATE101Shall have the 03 hours of theory examination(SEE), however, practical sessions question shall be included in the theory question papers. ** **The mathematics subject should be taught by a single faculty member per division, with no sharing of the course(subject)module-wise by different faculty members.**
#- BPHYE102SEE shall have the 03 hours of theory examination and 02-03 hours of practical examination.
ESC or ETC of 03 credits Courses shall have only a theory component (L:T :P:S=3:0:0:0) or if the nature the of course required experimental learning syllabus

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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		L	T	P	(ETC-I) Emerging Technology Courses-I		L	T	P
Code	Title				Code	Title			
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		L	T	P
Code	Title			
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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(Effectivefromtheacademicyear 2022-23)

IISemester (Electrical & Electronics EngineeringStream)   **(For the students who attended 1st semester under Physics Group)**

Sl. No	Course and Course Code		Course Title	TD/PSB	Teaching Hours/Week				Examination				
					Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
					L	T	P	S					
1	*ASC(IC)	BMATE201	**Mathematics-II** for EESI	Maths	2	2	2	0	03	50	50	100	04
2	#ASC(IC)	BCHEE202	**Chemistry** for EES	Chemistry	2	2	2	0	03	50	50	100	04
3	ESC	BCEDK203	Computer-Aided Engineering Drawing	Civil/Mech Engg dept	2	0	2	0	03	50	50	100	03
4	ESC-II	BESCK204x	Engineering Science Course-II	Respective Engg Dept	3	0	0	0	03	50	50	100	03
5	PLC-II	BPLCK205x	Programming Language Course-II	Any Dept	2	0	2	0	03	50	50	100	03
			OR										
	ETC-II	BETCK205x	Emerging Technology Course-II		03	0	0	0	03				
6	AEC	BPWKS206	Professional Writing Skills in English	Humanities	1	0	0	0	01	50	50	100	01
			OR										
		BENGK206	Communicative English										
7	HSMS	BICOK207	Indian Constitution	Humanities	1	0	0	0	01	50	50	100	01
			OR										
		BKSKK207/ BKBKK207	Samskrutika Kannada/ Balake Kannada										
8	HSMS	BSFHK258	Scientific Foundations of Health	Any Dept.	1	0	0	0	01	50	50	100	01
			OR										
		BIDTK258	Innovation and Design Thinking		1	0	0	0	01				
			TOTAL							400	400	800	20

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SDA-Skill Development Activities, **TD/PSB**- Teaching Department / Paper Setting Board, **ASC**-Applied Science Course, **ESC**- Engineering Science Courses, **ETC**- Emerging Technology Course, **AEC**- Ability Enhancement Course, **HSMS**-Humanity and Social Science and Management Course, **SDC**- Skill Development Course, **CIE** -Continuous Internal Evaluation, **SEE**- Semester End Examination, **IC** – Integrated Course (Theory Course Integrated with Practical Course)

*- BMATE201Shall have the 03 hours of theory examination(SEE), however, practical sessions question shall be included in the theory question papers. **** The mathematics subject should be taught by a single faculty member per division, with no sharing of the course(subject)module-wise by different faculty members.**

#- BCHEE202- SEE shall have the 03 hours of theory examination and 02-03 hours of practical examination

ESC or ETC of 03 credits Courses shall have only a theory component (L:T :P:S=3:0:0:0) or if the nature the of course required practical learning, syllabus 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-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
BESCK205E	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 BESCK205E, **Introduction to C Programming, and all courses under PLC and ETC groups can be taught by faculty of ANY DEPARTMENT**

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B.E. in Electrical and Electronic Engineering
Scheme of Teaching and Examinations2021
Outcome Based Education(OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2021 - 22)

III 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 21MAT31	Transform Calculus, Fourier Series and Numerical Technics	Maths	2	2	0		03	50	50	100	3
2	IPCC 21EE32	Analog Electronic Circuits and Op - Amps	TD: PSB	3	0	2		03	50	50	100	4
3	IPCC 21EE33	Electric Circuit Analysis	TD: PSB	3	0	2		03	50	50	100	4
4	PCC 21EE34	Transformers and Generators	TD: PSB	2	2	0		03	50	50	100	3
5	PCC 21EEL35	Electrical Machines Laboratory - I	TD: PSB	0	0	2		03	50	50	100	1
6	UHV 21UH36/49	Social Connect and Responsibility	Any Department	0	2	0		01	50	50	100	1
7	HSMC 21KSK37/47	Samskrutika Kannada	TD and PSB: HSMC	0	2	0		01	50	50	100	1
	HSMC 21KBK37/47	Balake Kannada										
		OR										
	HSMC 21CIP37/47	Constitution of India and Professional Ethics										
8	AEC 21EE38X	Ability Enhancement Course - III	TD: Concerned department PSB: Concerned Board	If offered as theory course: 0 / 2 / 0. If offered as lab. course: 0 / 0 / 2				01 / 02	50	50	100	1
							Total		400	400	800	18

					L	T	P	S					
9	Scheduled activities for III to VIII semesters	NMDC 21NS83	National Service Scheme (NSS)	NSS					All students have to register for any one of the course namely National Service Scheme, Physical Education (PE) (Sports and Athletics), and Yoga with the concerned coordinator of the course during the first week of III semester. The activities shall be carried out from III semester to VIII semester. SEE in the above courses shall be conducted during VIII semester examinations and the accumulated CIE marks shall be added to the SEE marks. Successful completion of the registered course 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.				
		NMDC 21PE83	Physical Education (PE)(Sports and Athletics)	PE									
		NMDC 21YO83	Yoga	Yoga									

				Course prescribed to lateral entry Diploma holders admitted to III semester B.E./B.Tech programs									
1	NCMC 21MATDIP31		Additional Mathematics - I	Maths	02	02	--	--	-	100	---	100	0

Note: BSC: Basic Science Course, **IPCC:** Integrated Professional Core Course, **PCC:** Professional Core Course, **INT** –Internship, **HSMC:** Humanity and Social Science & Management Courses, **AEC**–Ability Enhancement Courses. **UHV:** Universal Human Value Course.
L –Lecture, **T** – Tutorial, **P**- Practical/ Drawing, **S** – Self Study Component, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Examination. **TD**- Teaching Department, **PSB:** Paper Setting department
21KSK37/47 Samskrutika Kannada is for students who speak, read and write Kannada and **21KBK37/47** Balake Kannada is for non-Kannada speaking, reading, and writing students.

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Integrated Professional Core Course (IPCC): Refers to Professional Theory Core Course Integrated with Practicals 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 (BE/B.Tech.) 2021-22 may be referred.

21INT49 Inter/Intra Institutional Internship: All the students admitted to engineering programs under the lateral entry category shall have to undergo a mandatory 21INT49 Inter/Intra Institutional Internship of 03 weeks during the intervening period of III and IV semesters. The internship shall be slated for CIE only and will not have SEE. The letter grade earned through CIE shall be included in the IV semester grade card. The internship shall be considered as a head of passing and shall be considered for vertical progression and for the award of degree. Those, who do not take up / complete the internship shall be declared fail and shall have to complete subsequently after satisfying the internship requirements. The faculty coordinator or mentor shall monitor the students' internship progress and interact with them for the successful completion of the internship.

Non–credit mandatory courses (NCMC):
(A) Additional Mathematics I and II:
(1) These courses are prescribed for III and IV semesters respectively to lateral entry Diploma holders admitted to III semester of B.E./B.Tech., programs. They shall attend the classes during the respective semesters to complete all the formalities of the course and appear for the Continuous Internal Evaluation (CIE). In case, any student fails to register for the said course/fails to secure the minimum 40 % of the prescribed CIE marks, he/she shall be deemed to have secured an F grade. In such a case, the student has to fulfill the course requirements during subsequent semester/s to earn the qualifying CIE marks. These courses are slated for CIE only and has no SEE.
(2) Additional Mathematics I and II shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the courses shall be mandatory for the award of degree.
(3) Successful completion of the courses Additional Mathematics I and II shall be indicated as satisfactory in the grade card. Non-completion of the courses Additional Mathematics I and II shall be indicated as Unsatisfactory.
(B) National Service Scheme/Physical Education (Sport and Athletics)/ Yoga:
(1) Securing 40 % or more in CIE,35 % or more marks in SEE and 40 % or more in the sum total of CIE + SEE leads to successful completion of the registered course.
(2) In case, students fail to secure 35 % marks in SEE, they has to appear for SEE during the subsequent examinations conducted by the University.
(3) In case, any student fails to register for NSS, PE or Yoga/fails to secure the minimum 40 % of the prescribed CIE marks, he/she shall be deemed to have not completed the requirements of the course. In such a case, the student has to fulfill the course requirements during subsequent semester/s to earn the qualifying CIE marks.
(4) Successful completion of the course shall be indicated as satisfactory in the grade card. Non-completion of the course shall be indicated as Unsatisfactory.
(5) These courses shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the courses shall be mandatory for the award of degree.

Ability Enhancement Course – III			
21EEL381	Scilab for Transformers and Generators	21EEL383	555 IC Laboratory
21EEL382	Circuit laboratory using Pspice	21EEL384	Scilab for Mathematics

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IV SEMESTER

Sl. No	Course and Course Code	Course Title	Teaching Department (TD) and Question Paper Setting Board	Theory Lecture L	Tutorial T	Practical/ Drawing P	Self -Study S	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
1	BSC 21MAT41	Complex Analysis, Probability and Statistical Methods	Maths	2	2	0		03	50	50	100	3
2	IPCC 21EE42	Digital System Design	EE	3	0	2		03	50	50	100	4
3	IPCC 21EE43	Microcontroller	EE	3	0	2		03	50	50	100	4
4	PCC 21EE44	Electric Motors	EE	2	2	0		03	50	50	100	3
5	AEC 21BE45	Biology for Engineers	BT, CHE, PHY	2	0	0		02	50	50	100	2
6	PCC 21EEL46	Electrical Machines Laboratory - II	EE	0	0	2		03	50	50	100	1
7	HSMC 21KSK37/47	Samskrutika Kannada	HSMC	0	2	0		01	50	50	100	1
	HSMC 21KBK37/47	Balake Kannada										
		OR										
	HSMC 21CIP37/47	Constitution of India & Professional Ethics										
8	AEC 21EE48X	Ability Enhancement Course- IV	TD and PSB: Concerned department	If offered as theory Course 0 / 2 / 0				01	50	50	100	1
				If offered as lab. course 0 / 0 / 2				02				
9	UHV 21UH36/49	Universal Human Values	Any Department	0	2	0		01	50	50	100	1
10	INT 21INT49	Inter/Intra Institutional Internship	Evaluation By the appropriate authorities	Completed during the intervening period of II and III semesters by students admitted to first year of BE./B.Tech and during the intervening period of III and IV semesters by Lateral entry students admitted to III semester.				--	100	--	100	2
							Total		550	450	1000	22

	Course prescribed to lateral entry Diploma holders admitted to III semester of Engineering programs											
1	NCMC 21MATDIP41	Additional Mathematics - II	Maths	02	02	--	--	--	100	--	100	0

Note: BSC: Basic Science Course, IPCC: Integrated Professional Core Course, PCC: Professional Core Course, AEC –Ability Enhancement Courses, HSMC: Humanity and Social Science and Management Courses, UHV- Universal Human Value Courses.

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

21KSK37/47 Samskrutika Kannada is for students who speak, read and write Kannada and 21KBK37/47 Balake Kannada is for non-Kannada speaking, reading, and writing students.

Integrated Professional Core Course (IPCC): Refers to Professional Theory Core Course Integrated with Practicals 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 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 (BE/B.Tech.) 2021-22 may be referred.

Non – credit mandatory course (NCMC):

Additional Mathematics - II:

(1) Lateral entry Diploma holders admitted to III semester of B.E./B.Tech., shall attend the classes during the IV semester to complete all the formalities of the course and appear for the Continuous Internal Evaluation (CIE). In case, any student fails to register for the said course/fails to secure the minimum 40 % of the prescribed CIE marks, he/she shall be deemed to have secured an F grade. In such a case, the student has to fulfill the course requirements during subsequent semester/s to earn the qualifying CIE marks. These courses are slated for CIE only and has no SEE.

(2) Additional Mathematics I and II shall not be considered for vertical progression as well as for the calculation of SGPA and CGPA, but completion of the courses shall be mandatory for the award of degree.

(3) Successful completion of the course Additional Mathematics II shall be indicated as satisfactory in the grade card. Non-completion of the courses Additional Mathematics II shall be indicated as Unsatisfactory.

Ability Enhancement Course - IV			
21EEP481	Microcontroller Based Projects	21EEL483	Scilab for Electrical and Electronic Measurements
21EEL482	Scilab for Electric Motors	21EEL484	Simulation of Op-Amp Circuits

Internship of 04 weeks during the intervening period of IV and V semesters; 21INT68 Innovation/ Entrepreneurship/ Societal Internship.

(1) All the students shall have to undergo a mandatory internship of 04 weeks during the intervening period of IV and V semesters. The internship shall be slated for CIE only and will not have SEE. The letter grade earned through CIE shall be included in the VI semester grade card. The internship shall be considered as a head of passing and shall be considered for vertical progression and for the award of degree. Those, who do not take up / complete the internship shall be considered under F(fail) grade and shall have to complete subsequently after satisfying the internship requirements.

(2) Innovation/ Entrepreneurship Internship shall be carried out at industry, State and Central Government /Non-government organizations (NGOs), micro, small and medium enterprise (MSME), Innovation centers or Incubation centers, etc. Innovation need not be a single major breakthrough, it can also be a series of small or incremental changes. Innovation of any kind can also happen outside of the business world.

Entrepreneurship internships offers a chance to gain hands on experience in the world of entrepreneurship and helps to learn what it takes to run a small entrepreneurial business by performing intern duties with an established company. This experience can then be applied to future business endeavours. Start-ups and small companies are a preferred place to learn the business tactics for future entrepreneurs as learning how a small business operates will serve the intern well when he/she manages his/her own company. Entrepreneurship acts as a catalyst to open the minds to creativity and innovation. Entrepreneurship internship can be from several sectors, including technology, small and medium-sized sectors, and service sector.

(3) Societal or social internship.

Urbanization is increasing on a global scale; and yet, half the world's population still resides in rural areas and is devoid of many things that urban population enjoy. Rural internship, is a work-based activity in which students will have a chance to solve/reduce the problems of the rural place for better living.

As proposed under the AICTE rural internship programme, activities under Societal or social internship, particularly in rural areas, shall be considered for 40 points under AICTE activity point programme.

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V 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	18 EE51	Management and Entrepreneurship	EEE	3	0	--	03	40	60	100	3
2	PCC	18 EE52	Microcontroller	EEE	3	2	--	03	40	60	100	4
3	PCC	18 EE53	Power Electronics	EEE	3	2	--	03	40	60	100	4
4	PCC	18 EE54	Signals and Systems	EEE	3	--	--	03	40	60	100	3
5	PCC	18 EE55	Electrical Machine Design	EEE	3	--	--	03	40	60	100	3
6	PCC	18 EE56	High Voltage Engineering	EEE	3	--	--	03	40	60	100	3
7	PCC	18 EEL57	Microcontroller Laboratory	EEE	--	2	2	03	40	60	100	2
8	PCC	18 EEL58	Power Electronics Laboratory	EEE	--	2	2	03	40	60	100	2
9	HSMC	18CIV59	Environmental Studies	Civil/ Environmental [Paper setting: Civil Engineering Board]	1	--	--	02	40	60	100	1
				TOTAL	**18**	**10**	**4**	**26**	**360**	**540**	**900**	**25**

Note: PCC: Professional Core, HSMC: Humanity and Social Science.

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.

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VI 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	18 EE61	Control Systems	EEE	3	2	--	03	40	60	100	4
2	PCC	18 EE62	Power System Analysis – 1	EEE	3	2	--	03	40	60	100	4
3	PCC	18 EE63	Digital Signal Processing	EEE	3	2	--	03	40	60	100	4
4	PEC	18 EE64X	Professional Elective -1	EEE	3	--	--	03	40	60	100	3
5	OEC	18 EE65X	Open Elective -A	EEE	3	--	--	03	40	60	100	3
6	PCC	18 EEL66	Control System Laboratory	EEE	--	2	2	03	40	60	100	2
7	PCC	18 EEL67	Digital Signal Processing Laboratory	EEE	--	2	2	03	40	60	100	2
8	MP	18 EEMP68	Mini-project		--	--	2	03	40	60	100	2
9	Internship	--	Internship	To be carried out during the vacation/s of VI and VII semesters and /or VII and VIII semesters.								
			TOTAL		15	10	06	24	320	480	800	24

Note: PCC: Professional core, PEC: Professional Elective, OE: Open Elective, MP: Mini-project.

Professional Elective -1	
Course code under18XX64X	Course Title
18 EE641	Introduction to Nuclear Power
18 EE642	Electrical Engineering Materials
18 EE643	Computer Aided Electrical Drawing
18 EE644	Embedded System
18 EE645	Object Oriented Programming using C++
18EE646	Electric Vehicles Technologies
18EE647	Sensors and Transducers

Open Elective -A

Students can select any one of the open electives offered by other Departments expect those that are offered by the parent Department (Please refer to the list of open electives under 18XX65X).

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.

Mini-project work:
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 senior faculty members of the Department, one of whom shall be 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 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 college.

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.

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

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

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

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VII 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	18 EE71	Power System Analysis – 2	EEE	2	2	--	03	40	60	100	3
2	PCC	18 EE72	Power System Protection	EEE	3	--	--	03	40	60	100	3
3	PEC	18 EE73X	Professional Elective - 2	EEE	3	--	--	03	40	60	100	3
4	PEC	18 EE74X	Professional Elective - 3	EEE	3	--	--	03	40	60	100	3
5	OEC	18 EE75X	Open Elective -B	EEE	3	--	--	03	40	60	100	3
6	PCC	18 EEL76	PSS laboratory	EEE	--	2	2	03	40	60	100	2
7	PCC	18 EEL77	Relay & HV lab	EEE	--	2	2	03	40	60	100	2
8	Project	18 EEP78	Project Work Phase - 1	EEE	--	--	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	14	06	06	21	380	420	800	20

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

Professional Elective - 2

Course code under 18XX73X	Course Title
18EE731	Solar and Wind Energy
18EE732	**Micro and Nano Scale Sensors and Transducers**
18 EE733	Integrated of Distribution Generation.
18 EE734	Advanced Control Systems
18 EE735	Reactive Power Control in Electric Power Systems

Professional Electives - 3

Course code under 18 EE74X	Course Title
18 EE741	Industrial Drives and Application
18 EE742	Utilization of Electrical Power
18 EE743	**AI Techniques for Electrical and hybrid Electric Vehicles**
18 EE744	Smart Grid
18 EE745	Artificial Neural Network With Applications to Power Systems

Open Elective -B

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

Selection of an open elective shall not be allowed if,

The candidate has studied the same course during the previous semesters of the programme.

The syllabus content of open elective is similar to that of the Departmental core courses or professional electives.

A similar course, under any category, is prescribed in the higher semesters of the programme.

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

Project work:

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

CIE procedure for Project Work Phase - 1:

(i) Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.

The CIE marks awarded for the project work phase -1, shall be based on the evaluation of the project work phase -1 Report (covering Literature Survey, Problem identification, Objectives and Methodology), project presentation skill and question and answer session in the ratio 50:25:25.The marks awarded for the Project report shall be the same for all the batch mates.

(ii) Interdisciplinary: Continuous Internal Evaluation shall be group wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable.

The CIE marks awarded for the project work phase -1, shall be based on the evaluation of project work phase -1 Report(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.

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

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

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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	18EE81	Power System Operation and Control	EEE	3	--	--	03	40	60	100	3
2	PEC	18EE82X	Professional Elective - 4	EEE	3	--	--	03	40	60	100	3
3	Project	18EEP83	Project Work Phase - 2		--	--	2	03	40	60	100	8
4	Seminar	18EES84	Technical Seminar		--	--	2	03	100	--	100	1
5	Internship	18EEI85	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 Electives - 4	
Course code under 18XX82X	**Course Title**
18EE821	FACTs and HVDC Transmission
18EE822	Electrical Estimation and Costing
18EE823	Big Data Analytics in Power Systems
18EE824	Power System Planning
18EE825	Electrical Power Quality

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 EE) conducted at the department.

ii) **Interdisciplinary:** Contribution to the project and the performance of each group member shall be assessed individually in semeste   1 examination (SEE) conducted separately at the departments to which the student/s belong to.

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

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

Activity points of the students who have earned the prescribed AICTE activity Points shall be sent the University along with the CIE marks of 8th semester. In case of students who have not satisfied the AICTE activity Points at the end of eighth semester, the column under activity Points shall be marked NSAP (Not Satisfied Activity Points).

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B.E ELECTRICAL AND ELECTRONICS ENGINEERING
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

OPEN ELECTIVE - A

Course Code	18EE65X	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Students can select any one of the open electives offered by other Departments expect those that are offered by the parent Department (For syllabus, please refer to the concerned Programme syllabus book or VTU website vtu.ac.in may be visited.).
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.

Sl No	Board and the Department offering the Electives	Sl No	Course code under 18EE65X	Course Title
	Electrical and Electronics Engineering	1	18EE651	Industrial Servo Control Systems
		2	18EE652	PLC and SCADA
		3	18EE653	Renewable Energy Resources
		4	18EE654	Introduction to Data Analytics

B.E ELECTRICAL AND ELECTRONICS ENGINEERING Outcome
Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VII

OPEN ELECTIVE - B

Course Code	18EE75X	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Students can select any one of the open electives offered by other Departments expect those that are offered by the parent Department (For syllabus, please refer to the concerned Programme syllabus book or VTU website vtu.ac.in may be visited.).
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.

Sl No	Board and the Department offering the Electives	Sl No	Course code under 18EE75X	Course Title
	Electrical and Electronics Engineering	1	18EE751	Carbon Capture and Storage
		2	18EE752	Electric Vehicles
		3	18EE753	Disasters Management
		4	18EE754	Electrical Energy Conservation and Auditing

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