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				
Information Sceince and Engineering	IS	Applied Physics for CSE stream	BPHYS102	Library management system in C programming
Information Sceince and Engineering	IS	Principles of Programming Using C	BPOPS103	Breakout ball game
Information Sceince and Engineering	IS	Introduction to Internet of Things (IOT)	BETCK105H	Resume building web application
Information Sceince and Engineering	IS	Introduction to Python Programming	BPLCK205B	Student result management
Information Sceince and Engineering	IS	Introduction to Electronics Communication	BESCK204C	Personal budget tracker
Information Sceince and Engineering	IS			Sixth sense media layer
Information Sceince and Engineering	IS			Coupon generator system
Information Sceince and Engineering	IS			Faculty renumeration system
Information Sceince and Engineering	IS			E-plastic waste management system
Information Sceince and Engineering	IS			Social networking system
Information Sceince and Engineering	IS			Page for Online Food Delivery system using HTML and CSS
Information Sceince and Engineering	IS			student grade calculator using javascript
Information Sceince and Engineering	IS			Quiz Application in C Programming
Information Sceince and Engineering	IS			Fraud Detection for Financial transaction
SECOND YEAR				
Information Sceince and Engineering	IS	Digital Design & Computer Organization	BCS302	CGPA calculator using C++
Information Sceince and Engineering	IS	Operating Systems	BCS303	Weather Forecasting using Python
Information Sceince and Engineering	IS	Data Structures and Applications	BCS304	Responsive Image Carousel
Information Sceince and Engineering	IS	Object Oriented Programming with C++	BCS306B	QR Code Generator
Information Sceince and Engineering	IS	Data Visualization with Phyton	BCS358D	Brick Mania
Information Sceince and Engineering	IS	Analysis & Design of Algorithms	BCS401	To-Do List
Information Sceince and Engineering	IS	Advanced Java	BIS402	Financial Market Analysis
Information Sceince and Engineering	IS	Database Management Systems	BCS403	Online Quiz
Information Sceince and Engineering	IS	Green IT and Sustainability	BCS456A	Tour and Travel Agency Website
Information Sceince and Engineering	IS			Tic Tac Toe
Information Sceince and Engineering	IS			Face Recognition based Attendance system using python
Information Sceince and Engineering	IS			Airline Management System
Information Sceince and Engineering	IS			Bus Pass Management System using MySQL
Information Sceince and Engineering	IS			Music Player using Java Script
Information Sceince and Engineering	IS			Coffee Corner Website
Information Sceince and Engineering	IS			Canteen Management

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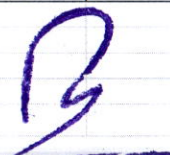Chikkasandra, Hesaraghatta Road,
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THIRD YEAR				
Information Sceince and Engineering	IS	Computer Networks	21CS52	CRM Recruitment Software Using Machine Learning
Information Sceince and Engineering	IS	Artificial Intelligence and Machine Learning	21CS54	Opinion Polarity Classification Model
Information Sceince and Engineering	IS	Database Management Systems Laboratory with Mini Project	21CSL55	A Smart Attendance Monitoring System Using CNN
Information Sceince and Engineering	IS	C# and .Net Framework	21CS582	Prediction Of Crop Yield Using Machine Learning
Information Sceince and Engineering	IS			Prediction And Analysis of E-commerce Sales Using Efficient Visualization Techniques
Information Sceince and Engineering	IS	Software Engineering and Project Management	21CS61	Sustainable Farming Using BigData & IOT
Information Sceince and Engineering	IS	Fullstack Development	21CS644	Deploying Cloud Native Application Using Jenkins
Information Sceince and Engineering	IS	Data science and Visualization	21INT68	Education And Career Recommendation System
Information Sceince and Engineering	IS	Mini Project	21ISMP67	Electric Vehicle Analysis Using Power BI
Information Sceince and Engineering	IS	Innovation/Entrepreneurship /Societal Internship	21CS62	Medicine Recommendation System
Information Sceince and Engineering	IS			Identification Of Medical Images To Recognize The lung Cancer Stages
Information Sceince and Engineering	IS			Smart Farming Using Machine Learning
Information Sceince and Engineering	IS			Netflix clone Using Web Development
Information Sceince and Engineering	IS			Multiple Disease Prediction Using Machine Learning
Information Sceince and Engineering	IS			Crop Recommendation System Using Machine Learning
Information Sceince and Engineering	IS			Obstacle Avoiding Car
Information Sceince and Engineering	IS			Analysis Of Player Performance Using Power BI
Information Sceince and Engineering	IS			Survey Analysis Using Power BI
Information Sceince and Engineering	IS			Prediction And Analysis Of PCOS Diagnosis With Machine Learning
Information Sceince and Engineering	IS			Flight Management System
Information Sceince and Engineering	IS			Content Management System
Information Sceince and Engineering	IS			Plant Disease Detection Using Neural Networks
Information Sceince and Engineering	IS			Real Estate Valuation Model
Information Sceince and Engineering	IS			Traffic Sign Recognition Using Deep Learning
Information Sceince and Engineering	IS			Remote Desktop Screen Sharing Using SOCKET.IO
Information Sceince and Engineering	IS			Face Detection, Age, Landmark, Expression Using Face API
Information Sceince and Engineering	IS			Stock Inventory Management System
Information Sceince and Engineering	IS			Identifying Criminals From Surveillance Camera Using Machine Learning
Information Sceince and Engineering	IS			Personality Type Based On MBPTI
Information Sceince and Engineering	IS			Sign Alphabet Recognition
Information Sceince and Engineering	IS			Jarvis- A Virtual AI Assistant
Information Sceince and Engineering	IS			Rainfall Prediction Using Machine Learning
Information Sceince and Engineering	IS			Lung Cancer Prediction Using Blockchain
FINAL YEAR				
Information Sceince and Engineering	IS			
Information Sceince and Engineering	IS	Artificial Intelligence and Machine Learning	18CS71	AI ASSISTED TELE MEDICINE KIOSK IN RURAL INDIA
Information Sceince and Engineering	IS	Big Data Analytics	18CS72	LUMPY DISEASE CLASSIFICATION USING DEEP LEARNING
Information Sceince and Engineering	IS	Artificial Intelligence and Machine Learning Laborato	18CSL76	DEEP NEURAL NETWORK-BASED GRAIN ADULTERATION DETECTION
Information Sceince and Engineering	IS	User Interface Design	18CS734	AUTOMATED INVIOLABLE SKULL CAP USING UBIQUITOUS COMPUTING

Information Sceince and Engineering	IS	Cryptography	18CS744	A NOVEL METHOD USING DEEP LEARNING FEATURES FOR DISASTER VICTIM DETECTION UNDER DEBRIS ENVIRONMENT
Information Sceince and Engineering	IS	Project Work Phase-1	18CSP77	KNEE OSTEOARTHRITIS DETECTION USING MACHINE LEARNING AND RADIOGRAPHIC IMAGES
Information Sceince and Engineering	IS	Internet of Things	18CS81	DETECTION OF PARTICULATE MATTER 2.5 &10 IN AIR IN DIFFERENT TIERS OF CITIES USING ML ALGORITHMS
Information Sceince and Engineering	IS	Storage Area Networks	18CS822	SELF GUIDED MACHINE LEARNING APPLICATION FOR RAILWAY SAFETY IMPROVEMENTS
Information Sceince and Engineering	IS	Project Work Phase-2	18CSP83	LUNG RETINANET : LUNG CANCER PREDICATION AND CLASSIFICATION
Information Sceince and Engineering	IS	Internship	INT	MULTI LABEL MULTIMODAL EMOTION RECOGNITION SYSTEM
Information Sceince and Engineering	IS	Technical Seminar	18CSS84	BRAIN STROKE PREDICTION USING MACHINE LEARNING
Information Sceince and Engineering	IS			ANOMALY DETECTION FOR VIDEO SURVEILLANCE USING CNN
Information Sceince and Engineering	IS			ML AND CNN BASED INSIGHTS INTO AUTISM SPECTRUM DISORDER
Information Sceince and Engineering	IS			DEEP LEARNING FOR OVARIAN CANCER SUBTYPE CLASSIFICATION USING HISTOPATHOLOGICAL IMAGES
Information Sceince and Engineering	IS			A COMPARATIVE STUDY OF DETECTION OF PARKINSON'S DISEASE USING MACHINE LEARNING TECHNIQUES
Information Sceince and Engineering	IS			BONE FRACTURE DETECTION SYSTEM USING IMAGE PROCESSING AND MACHINE LEARNING
Information Sceince and Engineering	IS			OPTIMIZED LIGHT WEIGHT FRAMEWORK FOR CLIENT DRIVEN VIDEO SUMMARIZATION USING 2D CNN
Information Sceince and Engineering	IS			PREDICTION OF BREAST CANCER AND ITS STAGES
Information Sceince and Engineering	IS			AUTOMATED VISION-BASED SURVEILLANCE SYSTEM TO DETECT AND UPLIFT DROWNING INCIDENTS IN SWIMMING POOLS
Information Sceince and Engineering	IS			VISION BASED ACCIDENT DETECTION SYSTEM USING AI/ML
Information Sceince and Engineering	IS			TUBERCULOSIS DETECTION FROM CHEST X-RAY IMAGES
Information Sceince and Engineering	IS			GPS BASED VEHICLE MONITORING SYSTEM USING IOT
Information Sceince and Engineering	IS			SECURE FILE STORAGE USING HYBRID CRYPTOGRAPHY ON CLOUD
Information Sceince and Engineering	IS			GREEN HOUSE MONITORING AND CONTROLLING USING IOT AND ML
Information Sceince and Engineering	IS			UNRAVELING MALICIOUS CO-EXISTENCE IN ANDROID APPLICATIONS
Information Sceince and Engineering	IS			EARLY DETECTION OF CARDIAC ARRHYTHMIA USING ENSEMBLE TECHNIQUE WITH SMART IOT WEARABLE DEVICE.
Information Sceince and Engineering	IS			AI BASED MALARIA DETECTION USING CNN
Information Sceince and Engineering	IS			VEHICLE MOVEMENT MONITORING IN FLOODED UNDERPASS USING IOT AND MI

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I Semester (CSE Stream) (Physics Group)

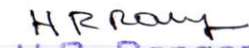| Sl. No	Course and course code		Course titlee	TD/PSB	Teaching Hours/Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	*ASC(IC)	BMATS101	**Mathematics-I** for CSE Stream	Maths	2	2	2	0	03	50	50	100	04
2	#ASC(IC)	BPHYS102	**Applied Physics** for CSE stream	Physics	2	2	2	0	03	50	50	100	04
3	ESC	BPOPS103	Principles of Programming Using C	CSE	2	0	2	0	03	50	50	100	03
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		OR										
	PLC-I	BPLCK105x	Programming Languages 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										
8	AEC/SDC	BIDTK158	Innovation and Design Thinking	Any Dept	1	0	0	0	02	50	50	100	01
			OR										
		BSFHK158	Scientific Foundations of Health		1	0	0	0	01				
			TOTAL							400	400	800	20

SDA-Skill Development Activities, **TD/PSB**- Teaching Department / Paper Setting Board, **ASC**-Applied Science Course, **ESC**- Engineering Science Courses, **ETC**-

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(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 22ESC145/245, Introduction to C Programming, and all courses under PLC and ETC groups can be taught by ANY DEPARTMENT

- The student has to select one course from the ESC-I group.
- CSE/ISE and allied branches Students shall opt for any one of the courses from the ESC-I group **except, BESCK104E-Introduction to C Programming**
- 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)

II Semester (CSE Streams) — (For students who attended 1st semester under Chemistry Group)

Sl. No	Course and Course Code		Course Title	TD/PSB	Teaching Hours/Week				Examination				
					Theory Lecture (L)	Tutorial (T)	Practical/ Drawing (P)	SDA (S)	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
1	*ASC(IC)	BMATS201	**Mathematics-II** for CSEStream	Maths	2	2	2	0	03	50	50	100	04
2	#ASC(IC)	BPHYS202	**Applied Physics** for CSE Stream	Physics	2	2	2	0	03	50	50	100	04
3	ESC	BPOPS203	Principles of Programming Using C	CSE	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	ETC-II	BPLCK205x	Programming Language Course-II	Any Dept	2	00	2	0	03	50	50	100	03
	OR		OR										
	PLC-II	BETCK205x	Emerging Technology Course-II		3	0	0	0	03				
6	AEC	BENGK206	Communicative English	Humanities	1	0	0	0	01	50	50	100	01
			OR										
		BPWSK206	Professional Writing Skills in English										
7	HSMC	BKSKK207 BKBKK207	Samskrutika Kannada/ Balake Kannada	Humanities	1	0	0	0	01	50	50	100	01
			OR										
		BICOK207	Indian Constitution										
8	AEC/SDC	BIDTK258	Innovation and Design Thinking	Any Dept	1	0	0	0	01	50	50	100	01
			OR										
		BSFHK258	Scientific Foundations of Health		1	0	0	0	01				
			TOTAL							400	400	800	20

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)

*- BMATS201Shall 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.**

#- BPHYS202SEE 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 of the of course required experimental 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		L	T	P	(ETC-II) Emerging Technology Courses-II		L	T	P
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		L	T	P
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 groups can be taught by ANY DEPARTMENT

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VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

B.E. in Information Science and Engineering

Scheme of Teaching and Examinations 2022

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

(Effective from the academic year 2023-24)

III SEMESTER

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/BSC	BCS301	Mathematics for Computer Science	TD: Maths PSB: Maths	3	2	0		03	50	50	100	4
2	IPCC	BCS302	Digital Design & Computer Organization	TD: IS PSB: CS	3	0	2		03	50	50	100	4
3	IPCC	BCS303	Operating Systems	TD: IS PSB: CS	3	0	2		03	50	50	100	4
4	PCC	BCS304	Data Structures and Applications	TD: IS PSB: CS	3	0	0		03	50	50	100	3
5	PCCL	BCSL305	Data Structures Lab	TD: IS PSB: CS	0	0	2		03	50	50	100	1
6	ESC	BCS306x	ESC/ETC/PLC	TD: IS PSB: CS	2	0	2		03	50	50	100	3
7	UHV	BSCK307	Social Connect and Responsibility	Any Department	0	0	2		01	100	---	100	1
8	AEC/ SEC	BCS358x	Ability Enhancement Course/Skill Enhancement Course – III	TD : Concerned department PSB: CS	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	21

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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 Technology Course, PLC: Programming Language Course

Engineering Science Course (ESC/ETC/PLC) (Note- Student should opt for the course which should not be similar to the course opted in 1st Year)			
BCS306A	Object Oriented Programming with Java	BCS306C	
BCS306B	Object Oriented Programming with C++	BCS306D	
Ability Enhancement Course – III			
BCS358A	Data analytics with Excel	BCS358C	Project Management with Git
BCS358B	R programming	BCS358D	Data Visualization with Phyton

Professional Core Course (IPCC): Refers to Professional Core Course Theory 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 (B.E./B.Tech.) 2022-23 may please be refered.

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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VARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
B.E. in Information Science and Engineering
Scheme of Teaching and Examinations2022
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
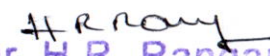(Effective from the academic year 2023-24)

IV SEMESTER

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	PCC/BSC	BCS401	Analysis & Design of Algorithms	TD: IS PSB: CS	3	0	0		03	50	50	100	3
2	IPCC	BIS402	Advanced Java	TD: IS PSB: CS	3	0	2		03	50	50	100	4
3	IPCC	BCS403	Database Management Systems	TD: IS PSB: CS	3	0	2		03	50	50	100	4
4	PCCL	BCSL404	Analysis & Design of Algorithms Lab	TD: IS PSB: CS	0	0	2		03	50	50	100	1
5	ESC	BCS405x	ESC/ETC/PLC	TD: IS/Maths PSB : IS/Maths	2	2	0		03	50	50	100	3
6	AEC/ SEC	BCS456x	Ability Enhancement Course/Skill Enhancement Course- IV	TD: Concerned department PSB: CS	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 (Information Technology in Biology)	TD / PSB: BT, CHE,	2	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									

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		BYOK459	Yoga						Yoga Teacher								
													Total	**500**	**400**	**900**	**19**

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.

Ability Enhancement Course / Skill Enhancement Course - IV

BCS456A	Green IT and Sustainability	BCS456C	UI/UX
BCS456B	Capacity Planning	BCS456D	Technical writing using LATEX

Engineering Science Course (ESC/ETC/PLC)

BCS405A	Discrete Mathematical Structures	BCS405C	Optimization Techniques
BCS405B	Graph Theory	BCS405D	Linear Algebra

Professional Core Course (IPCC): Refers to Professional Core Course Theory Integrated with practical of the same course. Credit for IPCC can be 04 and its 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

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 courses is mandatory for the award of degree.

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B.E. in Information Science and Engineering
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(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 21CS51	Automata Theory and compiler Design		3	0	0		03	50	50	100	3
2	IPCC 21CS52	Computer Networks		3	0	2		03	50	50	100	4
3	PCC 21CS53	Database Management Systems	Any CS Board Department	3	0	0		03	50	50	100	3
4	PCC 21CS54	Artificial Intelligence and Machine Learning		3	0	0		03	50	50	100	3
5	PCC 21CSL55	Database Management Systems Laboratory with Mini Project		0	0	2		03	50	50	100	1
6	AEC 21XX56	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 21CS58X/21 CSL58X	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 - IV

21CSL581	Angular JS and Node JS		21CS583	
21CS582	C# and .Net Framework		21CS584	

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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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 21CS61	Software Engineering and Project Management	Any CS Board Department	2	2	0		03	50	50	100	3
2	IPCC 21CS62	Fullstack Development		3	0	2		03	50	50	100	4
3	PCC 21IS63	Software Testing		3	0	0		03	50	50	100	3
4	PEC 21XX64x	Professional Elective Course-I		3	0	0		03	50	50	100	3
5	OEC 21XX65x	Open Elective Course-I	Concerned Department	3	0	0		03	50	50	100	3
6	PCC 21ISL66	Software Testing Laboratory	Any CS Board Department	0	0	2		03	50	50	100	1
7	MP 21ISMP67	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

21CS641	Agile Technology	21IS643	Data Mining and Data warehousing
21CS642	Advanced JAVA Programming	21CS644	Data science and Visualization

Open Electives – I offered by the Department to other Department students

21CS651	Introduction to Data Structures	21CS653	Introduction to Cyber Security
21CS652	Introduction to Database Management Systems	21CS654	Programming in JAVA

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 (MBA), Medicine, Arts, Commerce, etc., can seek permission, at least one month before the commencement of the semester, from the University by

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VII SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
					L	T	P					
1	PCC	18CS71	Artificial Intelligence and Machine Learning	CS / IS	4	--	--	03	40	60	100	4
2	PCC	18CS72	Big Data Analytics	CS / IS	4	--	--	03	40	60	100	4
3	PEC	18CS73X	Professional Elective – 2	CS / IS	3	--	--	03	40	60	100	3
4	PEC	18CS74X	Professional Elective – 3	CS / IS	3	--	--	03	40	60	100	3
5	OEC	18CS75X	Open Elective –B	CS / IS	3	--	--	03	40	60	100	3
6	PCC	18CSL76	Artificial Intelligence and Machine Learning Laboratory	CS / IS	--	--	2	03	40	60	100	2
7	Project	18CSP77	Project Work Phase – 1	CS / IS	--	--	2	--	100	--	100	1
8	INT	--	Internship	(If not completed during the vacation of VI and VII semesters, it has to be carried out during the intervening vacations of VII and VIII semesters								
			TOTAL		17	--	04	18	340	360	700	20

Note: PCC: Professional core, PEC: Professional Elective, OEC: Open Elective, INT: Internship.

Professional Elective - 2	
Course code under 18CS73X	Course Title
18CS731	Software Architecture and Design Patterns
18CS732	High Performance Computing
18CS733	Advanced Computer Architectures
18CS734	User Interface Design

Professional Electives – 3	
Course code under 18CS74X	Course Title
18CS741	Digital Image Processing
18CS742	Network management
18CS743	Natural Language Processing
18CS744	Cryptography
18CS745	Robotic Process Automation Design & Development

Open Elective –B (Not for CSE / ISE Programs)	
18CS751	Introduction to Big Data Analytics
18CS752	Python Application Programming
18CS753	Introduction to Artificial Intelligence
18CS754	Introduction to Dot Net framework for Application Development

Students can select any one of the open electives offered by any Department (Please refer to the list of open electives under 18CS75X).
Selection of an open elective is not allowed provided,
- 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 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/ Adviser/Mentor.

Project work: Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary project can be assigned to an individual student or to a group having not more than 4 students. In extraordinary cases, like the funded projects requiring students from different disciplines, the project student strength can be 5 or 6.
CIE procedure for Project Work Phase - 1:
(i) Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide. The CIE marks awarded for the project work phase -1, shall be based on the evaluation of the project work phase -1 Report (covering Literature Survey, Problem identification, Objectives and Methodology), project presentation skill and question and answer session in the ratio 50:25:25.The marks awarded for the Project report shall be the same for all the batch mates.
(ii) Interdisciplinary: Continuous Internal Evaluation shall be group wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable. The CIE marks awarded for the project work phase -1, shall be based on the evaluation of project work phase -1 Report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.
Internship: All the students admitted to III year of BE/B.Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not takeup/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	Teaching Hours /Week			Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
					Theory Lecture	Tutorial	Practical/ Drawing					
					L	T	P					
1	PCC	18CS81	Internet of Things	CS / IS	3	--	--	03	40	60	100	3
2	PEC	18CS82X	Professional Elective – 4	CS / IS	3	--	--	03	40	60	100	3
3	Project	18CSP83	Project Work Phase – 2	CS / IS	--	--	2	03	40	60	100	8
4	Seminar	18CSS84	Technical Seminar	CS / IS	--	--	2	03	100	--	100	1
5	INT	18CSI85	Internship	(Completed during the intervening vacations 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, OEC: Open Elective, INT: Internship.

Professional Electives – 4	
Course code under 18CS82X	**Course Title**
18CS821	Mobile Computing
18CS822	Storage Area Networks
18CS823	NoSQL Database
18CS824	Multicore Architecture and Programming

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 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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