



SCHEME & SYLLABUS



III -VIII Semester Scheme & Syllabus (2023-24)

Information Science & Engineering

AUTONOMOUS -2023

GLOBAL ACADEMY OF TECHNOLOGY

(Autonomous institution affiliated to VTU, Belagavi.

Accredited by NAAC with 'A' grade,

NBA Accredited CS, E&C, E&E, MECH and IS branches)

Ideal Homes Township,

Raja Rajeshwari Nagar, Bengaluru-560098.

Head of Department
fo. Science Engineer
bal Academy of Techno
Bangalore - 98



**Department of Information Science
and Engineering**



Global Academy of Technology

(An Autonomous Institution, affiliated to VTU, Belagavi, recognized by Karnataka and Approved by AICTE, New Delhi.)



Scheme of UG Autonomous Program – 2023 batch (3rd to 8th Semester)

III SEMESTER

Sl. No.	Course Code	Course Title	Course Type	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	MAT23301A	Discrete Mathematics and Graph Theory	BS	MAT	2	2	0	50	50	100	3
2	CSE23302	Data Structures	PCC	TD: ISE PSB: CSE	3	0	0	50	50	100	3
3	ISE23303	Operating Systems	PCC	TD: ISE PSB: ISE	4	0	0	50	50	100	4
4	ISE23304	Digital Logic Design & Computer Organization (Integrated)	IPCC	TD: ISE PSB: ISE	3	0	2	50	50	100	4
5	ISE23305X	ESC/ETC/PLC	ESC/ETC/PLC	TD: ISE PSB: ISE	2	0	2	50	50	100	3
6	SCK23306	Social Connect and Responsibility	Any Department		0	0	2	100	---	100	1
7	ISE23307X	Ability Enhancement Course – I (Theory)	AEC	TD: ISE PSB: ISE	1	0	0	50	50	100	1
		OR			OR						
		Ability Enhancement Course – I (Integrated)	AEC	TD: ISE PSB: ISE	0	0	2	50	50	100	1
8	NSK23308	National Service Scheme (NSS)	MC	NSS coordinator	0	0	2	100	---	100	0
	PEK23308	Physical Education (PE) (Sports and Athletics)		Physical Education Director							
	YOK23308	Yoga		Yoga Teacher							
9	CSEL23309	Data Structures Laboratory	PCCL	TD: ISE PSB: CSE	0	0	2	50	50	100	1
Total								500	350	900	20

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CC: 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 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)			
ISE23305A	Object Oriented Programming with Java	ISE23305C	Exploratory Data Analysis
ISE23305B	Object Oriented Programming with C++	ISE23305D	Security Engineering In IT
Ability Enhancement Course – III			
ISE23307A	Data analytics with Excel	ISE23307C	Project Management with Git
ISE23307B	R programming	ISE23307D	Python Programming

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 Code	Course Title	Course Type	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours/Week			Examination			CREDITS
					L	T	P	CIE	SEE	Total	
1	23MAT41A	Probability and Linear Algebra	BS	MAT	2	2	0	50	50	100	3
2	CSE23402	Design and Analysis of Algorithms	PCC	TD: ISE PSB: CSE	3	0	0	50	50	100	3
3	ISE23403	Database Management Systems (Integrated)	IPCC	TD: ISE PSB: ISE	3	0	2	50	50	100	4
4	ISE23404	Advanced Java (Integrated)	IPCC	TD: ISE PSB: ISE	3	0	2	50	50	100	4
5	ISE23405X	ESC/ETC/PLC	ESC/ETC/PLC	TD: ISE PSB: ISE	3	0	0	50	50	100	3
6	UHK23406	Universal Human Values	UHV	Any Department	1	0	0	50	50	100	1
7	ISE23407X	Ability Enhancement Course – II (Theory)	AEC	TD: ISE PSB: ISE	1	0	0	50	50	100	1
		OR			OR						
		Ability Enhancement Course – II (Integrated)	AEC	TD: ISE PSB: ISE	0	0	2	50	50	100	1
8	NSK23408	National Service Scheme (NSS)	MC	NSS coordinator	0	0	2	100	---	100	
	PEK23408	Physical Education (PE) (Sports and Athletics)		Physical Education Director							
	YOK23408	Yoga		Yoga Teacher							
9	CSEL23409	Algorithms Laboratory	PCCL	TD: ISE PSB: CSE	0	0	2	50	50	100	1
Total								500	400	900	20

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Engineering Science Course (ESC/ETC/PLC)			
ISE23405A	Block Chain Technology	ISE23405C	Game Theory
ISE23405B	Statistics for Data Science	ISE23405D	Image Processing
Ability Enhancement Course / Skill Enhancement Course – IV			
ISE23407A	Green IT and Sustainability	ISE23407C	UI/UX
ISE23407B	Capacity Planning for IT	ISE23407D	Technical writing using LATEX (Lab) (0:0:2)

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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B.E. in Information Science Engineering Scheme of Teaching and Examinations 2023

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

(Effective from the academic year 2023-24)



V 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	HSMS	ISE23501	Software Engineering & Project Management	TD: ISE PSB: ISE	3	0	0		03	50	50	100	3
2	IPCC	ISE23502	Computer Networks (Integrated)	TD: ISE PSB: ISE	3	0	2		03	50	50	100	4
3	PCC	ISE23503	Theory of Computation	TD: ISE PSB: ISE	3	2	0		03	50	50	100	4
4	PCCL	ISEL23504	Data Visualization Lab	TD: ISE PSB: ISE	0	0	2		03	50	50	100	1
5	PEC	ISE23505X	Professional Elective - I	TD: ISE PSB: ISE	3	0	0		03	50	50	100	3
6	PROJ	ISEP23506	Mini Project	TD: ISE PSB: ISE	0	0	4		03	100	--	100	2
7	AEC	RMIK23507	Research Methodology and IPR	Any Department	2	2	0		03	50	50	100	3
8	MC	CIVK23508	Environmental Studies	TD: CV/Env/Chem PSB: CV	2	0	0		02	50	50	100	2
9	MC	NSK23509	National Service Scheme (NSS)	NSS coordinator	0	0	2			100	--	100	0
		PEK23509	Physical Education (PE) (Sports and Athletics)	Physical Education Director									
		YOK23509	Yoga	Yoga Teacher									
Total									550	350	900	22	

Signature

Professional Elective Course - I

ISE23505A	Computer Vision	ISE23505C	Distributed Systems
ISE23505B	Unix System Programming	ISE23505D	Cloud Computing

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 :** The letter in the course code indicates common to all the stream of engineering. **PROJ:** Project /Mini Project. **PEC:** Professional Elective Course.

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 course is mandatory for the award of degree.

Mini-project work: Mini Project is a laboratory-oriented/hands on course that will provide a platform to students to enhance their practical knowledge and skills by the development of small systems/applications etc. 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 the 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 the 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.

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. The minimum number of students' strengths for offering a professional elective is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.





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

(Effective from the academic year 2023-24)



VI SEMESTER

Sl. No	Course and Course Code		Course Title	Teaching Department (TD) and Question Paper Setting Board (PSB)	Teaching Hours /Week				Examination				Credits
					TD: Theory Lecture	Tutorial	TD: Practical/ Drawing	TD: Self-Study	TD: Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	IPCC	ISE23601	Full Stack Development (Integrated)	ISE PSB: ISE	3	0	2		03	50	50	100	4
2	PCC	ISE23602	Machine Learning	TD: ISE PSB: ISE	4	0	0		03	50	50	100	4
3	PEC	ISE23603X	Professional Elective - II	TD: ISE PSB: ISE	3	0	0		03	50	50	100	3
4	OEC	ISE23604X	Open Elective -I	ISE PSB: ISE	3	0	0		03	50	50	100	3
5	PROJ	ISEP23605	Major Project Phase - I	TD: ISE PSB: ISE	0	0	4		03	100	--	100	2
6	PCCL	ISEL23606	Machine Learning Lab	ISE PSB: ISE	0	0	2		03	50	50	100	1
7	AEC/ SDC	ISE23607X	Ability Enhancement Course/ SkillDevelopment Course - III	ISE PSB: ISE	If the course is offered as a Theory				01	50	50	100	1
					1	0	0						
					If course is offered as a practical								
					0	0	2						
8	MC	NSK23608	National Service Scheme (NSS)	NSS coordinator	0	0	2			100	---	100	0
		PEK23608	Physical Education (PE) (Sports and Athletics)	Physical Education Director									
		YOK23608	Yoga	Yoga Teacher									
9	IKS	IKSK23609	Indian Knowledge System	Any Department	1	0	0		01	100	-	100	0
Total									600	300	900	18	

Signature

Professional Elective Course

ISE23603A	Software Architecture & Design Pattern	ISE23603C	Wireless Sensor Networks
ISE23603B	Ethical Hacking	ISE23603D	Computer Graphics

Open Elective Course

ISE23604A	Introduction to Data Structures	ISE23604C	Introduction to Computer Networks
ISE23604B	Introduction to Operating Systems	ISE23604D	Introduction to JAVA

Ability Enhancement Course / Skill Enhancement Course - III

ISE23607A	Mobile Application Development	ISE23607C	IT Law and Ethics
ISE23607B	Tosca – Automated Software Testing	ISE23607D	Devops

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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 course is mandatory for the award of degree.

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. The minimum number of students' strengths for offering professional electives is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.

Open Elective Courses:

Students belonging to a particular stream of Engineering and Technology are not entitled to the open electives offered by their parent Department. However, they can opt for 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. The minimum numbers of students' strength for offering Open Elective Course is 10. However, this condition shall not be applicable to class where the admission to the program is less than 10.

Project Phase-I : Students have to discuss with the mentor /guide and with their help he/she has to complete the literature survey and prepare the report and finally define the problem statement for the project work.



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(Effective from the academic year 2023-24)



Scheme A- VII SEMESTER (Swappable VII and VIII 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	IPCC	ISE23701	Big Data Analytics (Integrated)	TD: ISE PSB: ISE	3	0	2		03	50	50	100	4
2	IPCC	ISE23702	Industrial IOT (Integrated)	TD: ISE PSB: ISE	3	0	2		03	50	50	100	4
3	PCC	ISE23703	Information and Network Security	TD: ISE PSB: ISE	4	0	0		03	50	50	100	4
4	PEC	ISE23704x	Professional Elective-III	TD: ISE PSB: ISE	3	0	0		03	50	50	100	3
5	OEC	ISE23705x	Open Elective- II	TD: ISE PSB: ISE	3	0	0		01	50	50	100	3
6	PROJ	ISEP23706	Major Project Phase-II	TD: ISE PSB: ISE	0	0	12		03	100	100	200	6
Total										350	350	700	24

Professional Elective Course

ISE23704A	Deep Learning	ISE23704C	Information Retrieval and Natural Language Processing
ISE23704B	Quantum Computing	ISE23704D	.Net Framework for Applications

Open Elective Course

ISE23705A	Introduction to DBMS	ISE23705C	Introduction to Software Engineering
ISE23705B	ReactJS	ISE23705D	Web Technology

PCC: Professional Core Course, **PCCL:** Professional Core Course laboratory, **PEC:** Professional Elective Course, **OEC:** Open Elective Course **PR:** Project Work, **L:** Lecture, **T:** Tutorial, **P:** Practical **S= SDA:** Skill Development Activity, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Evaluation. **TD-** Teaching Department, **PSB:** Paper Setting department, **OEC:** Open Elective Course, **PEC:** Professional Elective Course. **PROJ:** Project work

Note: VII and VIII semesters of IV years of the program

(1) Institutions can swap the VII and VIII Semester Schemes of Teaching and Examinations to accommodate research internships/ industry internships 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 the VII or VIII semesters is completed during the beginning of the IV year or the later part of IV years of the program.

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. The minimum number of students' strengths for offering professional electives is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.

Open Elective Courses:

Students belonging to a particular stream of Engineering and Technology are not entitled to the open electives offered by their parent Department. However, they can opt for 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. The minimum numbers of students' strength for offering Open Elective Course is 10. However, this condition shall not be applicable to class where the admission to the program is less than 10.

PROJECT WORK (21MEP75): The objective of the Project work is

- (i)** To encourage independent learning and the innovative attitude of the students.
- (ii)** To develop interactive attitude, communication skills, organization, time management, and presentation skills.
- (iii)** To impart flexibility and adaptability.
- (iv)** To inspire team working.
- (v)** To expand intellectual capacity, credibility, judgment and intuition.
- (vi)** To adhere to punctuality, setting and meeting deadlines.
- (vii)** To install responsibilities to oneself and others.
- (viii)** To train students to present the topic of project work in a seminar without any fear, face the audience confidently, enhance communication skills, involve ingroup discussion to present and exchange ideas.

CIE procedure for Project Work:

(1) 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 shall be based on the evaluation of the project work 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 batchmates.

(2) 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 shall be based on the evaluation of project work 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 procedure for Project Work: SEE for project work will be conducted by the two examiners appointed by the University. The SEE marks awarded for the project work shall be based on the evaluation of project work Report, project presentation skill, and question and answer session in the ratio 50:25:25.



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(Effective from the academic year 2023-24)



Scheme A- VIIISEMESTER (Swappable VII and VIII 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	
1	PEC	ISE23801x	Professional Elective -IV (Online Courses)	TD: ISE PSB: ISE	3	0	0		03	50	50	100	3
2	OEC	ISE23802x	Open Elective - III (Online Courses)	TD: ISE PSB: ISE	3	0	0		03	50	50	100	3
3	INT	ISEI23803	Internship (Industry/Research) (14 - 20 weeks)	TD: -	0	0	12		03	100	100	200	10
Total									200	200	400	16	

Professional Elective Course (Online courses)

ISE23801A	Reinforcement Learning (Tentative) https://nptel.ac.in/courses/106106143	ISE23801C	Multi-Core Computer Architecture (Tentative) https://nptel.ac.in/courses/106103184
ISE23801B	Social Network Analysis (Tentative) https://nptel.ac.in/courses/106106239	ISE23801D	Design & Implementation of Human-Computer Interfaces (Tentative) https://nptel.ac.in/courses/106103237

Open Elective Courses (Online Courses)

ISE23802A	Software Testing (Tentative) https://nptel.ac.in/courses/106101163	ISE23802C	Responsible & Safe AI Systems (Tentative) https://nptel.ac.in/courses/106106472
ISE23802B	Introduction to Industry 4.0 and Industrial Internet of Things (Tentative) https://nptel.ac.in/courses/106105195	ISE23802D	Data Science for Engineers (Tentative) https://nptel.ac.in/courses/106106179

L: Lecture, **T:** Tutorial, **P:** Practical **S= SDA:** Skill Development Activity, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Evaluation. **TD-** Teaching Department, **PSB:** Paper Setting department, **OEC:** Open Elective Course, **PEC:** Professional Elective Course. **PROJ:** Project work, **INT:** Industry Internship / Research Internship / Rural Internship

Note: VII and VIII semesters of IV years of the program

Swapping Facility

- Institutions can swap VII and VIII Semester Scheme of Teaching and Examinations to accommodate **research internships/ industry internships/Rural Internship** after the VI semester.

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- 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 years of the program i.e., after VI semester, VII semester classwork and VIII semester **Research Internship /Industrial Internship / Rural Internship** shall be permitted to be operated simultaneously by the University so that students have ample opportunity for an internship. In other words, a good percentage of the class shall attend VII semester classwork, and a similar percentage of others shall attend Research Internship or Industrial Internship or Rural Internship.

Research/Industrial /Rural Internship shall be carried out at an Industry, NGO, MSME, Innovation Centre, Incubation Centre, Start-up, Centre of Excellence (CoE), Study Centre established in the parent institute and /or at reputed research organizations/institutes.

The mandatory Research internship /Industry internship / Rural Internship is for 14 to 20 weeks. The internship shall be considered as a head of passing and shall be considered for the award of a degree. Those who do not take up/complete the internship shall be declared to fail and shall have to complete it during the subsequent University examination after satisfying the internship requirements.

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.

Rural Internship: Rural development internship is an initiative of Unnat Bharat Abhiyan Cell, RGIT in association with AICTE to involve students of all departments studying in different academic years for exploring various opportunities in techno-social fields, to connect and work with Rural India for their upliftment.

The faculty coordinator or mentor must monitor the student's 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 the internship.

With the consent of the internal guide and Principal of the Institution, students shall be allowed to carry out the internship at their hometown (**within or outside the state or abroad**), provided favorable facilities are available for the internship and the student remains regularly in contact with the internal guide. **University shall not bear any cost involved in carrying out the internship by students.** However, students can receive any financial assistance extended by the organization.

Professional Elective /Open Elective Course: These are ONLINE courses suggested by the respective Board of Studies. Details of these courses shall be made available for students on the VTU web portal.





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(Effective from the academic year 2023-24)



VI SEMESTER Scheme B - for the candidates who seek a two-semester internship with project work /Start-up

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	
1	IPCC	ISE23601	Full Stack Development (Integrated)	TD: IS PSB: IS	3	0	2		03	50	50	100	4
2	PCC	ISE23602	Machine Learning	TD: IS PSB: IS	4	0	0		03	50	50	100	4
3	PEC	ISE23603X	Professional Elective - II	TD: IS PSB: IS	3	0	0		03	50	50	100	3
4	OEC	ISE23604X	Open Elective -I	TD: IS PSB: IS	3	0	0		03	50	50	100	3
5	PCCL	22ISEL66	Machine Learning Lab	TD: IS PSB: IS	0	0	2		03	50	50	100	1
6	AEC/ SDC	ISE23607X	Ability Enhancement Course/ Skill Development Course - III	TD & PSB: Concerned Department	If the course is offered as a Theory				01	50	50	100	1
					1	0	0						
					If course is offered as a practical								
					0	0	2						
7	MC	NSK23608	National Service Scheme (NSS)	NSS coordinator	0	0	2			100	---	100	0
		PEK23608	Physical Education (PE) (Sports and Athletics)	Physical Education Director									
		YOK23608	Yoga	Yoga Teacher									
8	IKS	IKSK23609	Indian Knowledge System	Any Department	1	0	0		01	100	--	100	0
Total									500	300	800	16	

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Professional Elective Course			
ISE23603A	Block Chain Technology	ISE23603C	Wireless Sensor Networks
ISE23603B	Ethical Hacking	ISE23603D	Computer Graphics
Open Elective Course			
ISE23604A	Introduction to Data Structures	ISE23604C	Introduction to Computer Networks
ISE23604B	Introduction to Operating Systems	ISE23604D	Introduction to JAVA
Ability Enhancement Course / Skill Enhancement Course - III			
ISE23607A	Mobile Application Development	ISE23607C	IT Law and Ethics
ISE23607B	Tosca – Automated Software Testing	ISE23607D	Devops
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 : The letter in the course code indicates common to al the stream of engineering. PROJ: Project /Mini Project. PEC: Professional Elective Course. PROJ: Project Phase -I, OEC: Open Elective Course			
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 course is mandatory for the award of degree.			
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. The minimum number of students’ strengths for offering professional electives is 10. However, this conditional shall not be applicable to cases where the admission to the program is less than 10.			
Open Elective Courses: Students belonging to a particular stream of Engineering and Technology are not entitled to the open electives offered by their parent Department. However, they can opt for 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. The minimum numbers of students’ strength for offering Open Elective Course is 10. However, this condition shall not be applicable to class where the admission to the program is less than 10.			
Project Phase-I : Students have to discuss with the mentor /guide and with their help he/she has to complete the literature survey and prepare the report and finally define the problem statement for the project work.			





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Scheme B - VII and VIII semesters for the candidates who seek an internship with project work)

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	
1	IPCC	ISE23701	Big Data Analytics (Integrated)	TD: IS PSB: IS	3	0	2		03	50	50	100	4
2	IPCC	ISE23702	Industrial IOT (Integrated)	TD: IS PSB: IS	3	0	2		03	50	50	100	4
3	PCC	ISE23703	Information and Network Security	TD: IS PSB: IS	4	0	0		03	50	50	100	3
4	PEC	ISE23704x	Professional Elective-III (MOOC COURSES)	TD: IS PSB: IS	3	0	0		03	50	50	100	3
5	OEC	ISE23705x	Open Elective- II (MOOC COURSES)	TD: IS PSB: IS	3	0	0		01	50	50	100	3
6	PEC	ISE23801x	Professional Elective-IV (MOOC COURSES)	TD: IS PSB: IS	3	0	0		03	50	50	100	3
7	OEC	ISE23802x	Open Elective- III (MOOC COURSES)	TD: IS PSB: IS	3	0	0		03	50	50	100	3
8	PROJ	ISEP23804	Major Project Phase-II	TD: IS PSB: IS	0	0	12		03	100	100	200	9
9	INT	ISEI23803	Internship (Industry/Research) (14 - 20 weeks)	TD: IS PSB: IS	0	0	12		03	100	100	200	10
Total									550	550	1100	42	

PCC: Professional Core Course, **PCCL:** Professional Core Course laboratory, **PEC:** Professional Elective Course, **OEC:** Open Elective Course **PR:** Project Work, **L:** Lecture, **T:** Tutorial, **P:** Practical **S= SDA:** Skill Development Activity, **CIE:** Continuous Internal Evaluation, **SEE:** Semester End Evaluation. **TD-** Teaching Department, **PSB:** Paper Setting department, **OEC:** Open Elective Course, **PEC:** Professional Elective Course. **PROJ:** Project work

Note: VII and VIII semesters of IV years of the program

(1) Institutions can swap the VII and VIII Semester Schemes of Teaching and Examinations to accommodate research internships/ industry internships after the VI

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