



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE
(Autonomous)
Gobichettipalayam, Erode -638455
Regulation 2023 (UG)
Curriculum and Syllabus
BE-Computer Science and Engineering

I. Program Educational Objective (PEO)

PEO1 : Technical Skills: Apply their technical competence in computer science to solve real world problems, with technical and people leadership

PEO2 : Problem Solving Skills: Conduct cutting edge study and develop solutions on problems of social relevance.

PEO3 : Professional Skills: Work in a business environment, exhibiting team skills, work ethics, adaptability and lifelong learning

II. Program Outcomes (POs)

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

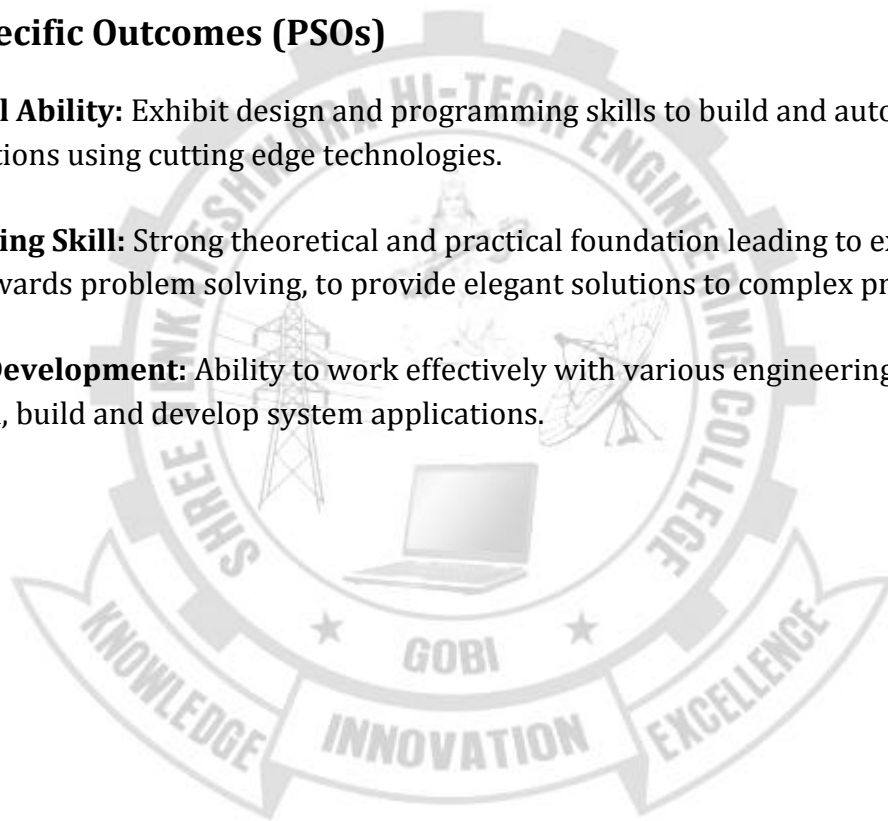
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

III. Program Specific Outcomes (PSOs)

PSO 1 : Technological Ability: Exhibit design and programming skills to build and automate business solutions using cutting edge technologies.

PSO 2 : Problem Solving Skill: Strong theoretical and practical foundation leading to excellence and excitement towards problem solving, to provide elegant solutions to complex problems.

PSO 3 : Application Development: Ability to work effectively with various engineering fields as a team to design, build and develop system applications.



Mapping of Course Outcome and Programme Outcome

Year	Sem	Course name	PO												PSO		
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
I	I	Induction Programme															
		Professional English - I	-	-	-	2	-	1	-	-	2	3	-	3			
		Matrices and Calculus	3	3	1	1	-	-	-	-	2	-	2	3			
		Engineering Physics	3	3	2	1	2	-	-	-	-	-	-	1			
		Engineering Chemistry	3	2	2	1	1	2	3	-	-	-	-	1			
		Problem Solving and Python Programming	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3
		தமிழர் மரபு /Heritage of Tamils															
		Problem Solving and Python Programming Laboratory	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3
		Physics and Chemistry Laboratory	3	3	1	1	-	-	-	-	-	-	-	-	-		
	3		2	1	-	1	3	2	1	-	-	-	1				
	English Laboratory	-	-	-	-	-	-	-	1	3	3	-	2				
	II	Professional English - II	-	1	1	-	-	-	1	1	2	3	-	2			
		Numerical Methods and Statistics	3	3	1	1	1	-	-	-	2	-	2	3			
		Physics for Information Science	3	1	2	1	2	1	1	1	-	-	-	-			
		Basic Electrical and Electronics Engineering	3	3	2	2	-	-	-	-	-	1	-	-	3	3	2
		Engineering Graphics	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
		Programming in C	2	2	2	1	2	1	1	1	2	-	3	2	2	2	2
		தமிழரும் தொழில்நுட்பமும் /Tamils and Technology															
Engineering Practices Laboratory		3	2	-	-	1	1	1	-	-	-	-	2	2	1	1	
Programming in C Laboratory		2	2	3	2	1	2	-	-	2	1	2	2	2	2	2	
Communication Laboratory	-	-	2	-	-	-	-	1	3	3	-	3	-	-	2		

1 - low, 2 - medium, 3 - high, '-' - no correlation

SUMMARY OF CREDITS

S.No	Course Category	Credits per Semester								Total Credits	Credits in %	Credits as per AU Curriculum R-2021	Credits as per AICTE Model Curriculum R-2022
		I	II	III	IV	V	VI	VII	VIII				
1	HSS	4	3					5		12	7.31	12	16
2	BS	12	7	4	2					25	15.24	25	23
3	ES	5	9	4						18	10.97	18	29
4	PC		5	14	20	14	8			61	37.19	61	59
5	PE					6	12			18	10.97	18	12
6	OE						3	9		12	7.31	12	9
7	EEC	1	2	1				4	10	18	10.97	16	15
8	MC		√		√	√	√						-
Total Credits / Semester		22	26	23	22	20	23	18	10	164	100	162	163

CATEGORIZATION OF COURSES

- i. Humanities and Social Sciences including Management Courses (HSS)
- ii. Basic Science Courses (BS)
- iii. Engineering Science Courses (ES)
- iv. Professional Core Courses (PC)
- v. Professional Elective Courses (PE)
- vi. Open Elective Courses (OE)
- vii. Mandatory Courses (MC)
- viii. Employability Enhancement Courses (EEC)
- ix. Other Courses (OC)

ENROLLMENT FOR B.E. / B. TECH. (HONOURS) / MINOR DEGREE (OPTIONAL)

A student can also optionally register for additional courses (18 credits) and become eligible for the award of B.E. / B. Tech. (Honours) or Minor Degree.

For B.E. / B. Tech. (Honours), a student shall register for the additional courses (18 credits) from semester V onwards. These courses shall be from the same vertical or a combination of different verticals of the same programme of study only.

For minor degree, a student shall register for the additional courses (18 credits) from semester V onwards. All these courses have to be in a particular vertical from any one of the other programmes,



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

Regulation 2023 (UG)

Curriculum and Syllabus

BE-Computer Science and Engineering

SEMESTER I

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Induction Program											
1.	23IPA11	Induction Programme	-	-	-	-	-	0	-	-	-
Theory											
2.	23ENT11	Professional English - I	HSS	3	0	0	3	3	40	60	100
3.	23MAT11	Matrices and Calculus	BS	3	1	0	4	4	40	60	100
4.	23PHT11	Engineering Physics	BS	3	0	0	3	3	40	60	100
5.	23CYT11	Engineering Chemistry	BS	3	0	0	3	3	40	60	100
6.	23CST11	Problem Solving and Python Programming	ES	3	0	0	3	3	40	60	100
7.	23TAT11	தமிழர் மரபு /Heritage of Tamils	HSS	1	0	0	1	1	40	60	100
Practicals											
8.	23CSL11	Problem Solving and Python Programming Laboratory	ES	0	0	4	4	2	60	40	100
9.	23PCL11	Physics and Chemistry Laboratory	BS	0	0	4	4	2	60	40	100
10.	23ENL11	English Laboratory	EEC	0	0	2	2	1	60	40	100
Total				16	1	10	27	22			



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

Regulation 2023 (UG)

Curriculum and Syllabus

BE-Computer Science and Engineering

SEMESTER II

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23ENT21	Professional English - II	HSS	2	0	0	2	2	40	60	100
2.	23MAT21	Numerical Methods and Statistics	BS	3	1	0	4	4	40	60	100
3.	23PHT21	Physics for Information Science	BS	3	0	0	3	3	40	60	100
4.	23EET22	Basic Electrical and Electronics Engineering	ES	3	0	0	3	3	40	60	100
5.	23MET21	Engineering Graphics	ES	2	0	4	6	4	40	60	100
6.	23CST21	Programming in C	PC	3	0	0	3	3	40	60	100
7.	23TAT21	தமிழரும் தொழில்நுட்பமும் /Tamil and Technology	HSS	1	0	0	1	1	40	60	100
Practicals											
8.	23MEL21	Engineering Practices Laboratory	ES	0	0	4	4	2	60	40	100
9.	23CSL21	Programming in C Laboratory	PC	0	0	4	4	2	60	40	100
10.	23ENL21	Communication Laboratory	EEC	0	0	4	4	2	60	40	100
Mandatory Courses											
11.	23MCL21	Mandatory Course - I &	MC	0	0	1	1	0	100	-	100
Total				17	1	17	35	26			

& Mandatory Course-I

Yoga for Human Excellence	Non-credit Course
---------------------------	-------------------



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

Regulation 2023 (UG)

Curriculum and Syllabus

BE-Computer Science and Engineering

SEMESTER III

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23MAT31	Discrete Mathematics	BS	3	1	0	4	4	40	60	100
2.	23CST31	Foundations of Data Science	PC	3	0	0	3	3	40	60	100
3.	23CST32	Data Structures	PC	3	0	0	3	3	40	60	100
4.	23CST33	Object Oriented Programming	PC	3	0	0	3	3	40	60	100
5.	23ECI31	Digital Principles and Computer Organization	ES	3	0	2	5	4	50	50	100
Practicals											
6.	23CSL31	Data Science Laboratory	PC	0	0	3	3	1.5	60	40	100
7.	23CSL32	Data Structures Laboratory	PC	0	0	3	3	1.5	60	40	100
8.	23CSL33	Object Oriented Laboratory	PC	0	0	4	4	2	60	40	100
9.	23PDL31	Professional Development	EEC	0	0	2	2	1	100	-	100
Total				15	1	14	30	23			



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

Regulation 2023 (UG)

Curriculum and Syllabus

BE-Computer Science and Engineering

SEMESTER IV

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23CST41	Introduction to Operating Systems	PC	3	0	0	3	3	40	60	100
2.	23CST42	Database Management Systems	PC	3	0	0	3	3	40	60	100
3.	23CST43	Theory of Computation	PC	3	0	0	3	3	40	60	100
4.	23CYT41	Environmental Sciences and Sustainability	BS	2	0	0	2	2	40	60	100
5.	23CSI41	Artificial Intelligence and Machine Learning	PC	3	0	2	5	4	50	50	100
6.	23CSI42	Algorithms	PC	3	0	2	5	4	50	50	100
Practicals											
7.	23CSL41	Operating Systems Laboratory	PC	0	0	3	3	1.5	60	40	100
8.	23CSL42	Database Management Systems Laboratory	PC	0	0	3	3	1.5	60	40	100
Mandatory Courses											
9.	23SAT41	Soft and Analytical Skills-I*	MC	1	0	0	1	0	-	-	-
Total				18	0	10	28	22			

* Soft and Analytical Skills-I is a Non-credit Course



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE
(Autonomous)
Gobichettipalayam, Erode -638455

Regulation 2023 (UG)
Curriculum and Syllabus
BE-Computer Science and Engineering

SEMESTER V

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23CST51	Cryptography and Cyber Security	PC	3	0	0	3	3	40	60	100
2.	23CST52	Distributed Computing	PC	3	0	0	3	3	40	60	100
3.	23CSI51	Computer Networks	PC	3	0	2	5	4	50	50	100
4.	23CSI52	Compiler Design	PC	3	0	2	5	4	50	50	100
5.		Professional Elective I*	PE	-	-	-	-	3	-	-	100
6.		Professional Elective II*	PE	-	-	-	-	3	-	-	100
Mandatory Courses											
7.		Mandatory Course - II&	MC	3	0	0	3	0	100	-	100
8.	23SAT51	Soft and Analytical Skills-II&&	MC	1	0	0	1	0	-	-	-
Total								20			

* Professional Elective - I & II shall be chosen from the list of Professional electives (Verticals) offered by same Programme

& Mandatory Course-II is a Non-credit Course (Student shall select one course from the list given under Mandatory Course-II)

&& Soft and Analytical Skills-II is a Non-credit Course



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE
(Autonomous)
Gobichettipalayam, Erode -638455

Regulation 2023 (UG)
Curriculum and Syllabus
BE-Computer Science and Engineering

SEMESTER VI

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23CSI61	Object Oriented Software Engineering	PC	3	0	2	5	4	50	50	100
2.	23ECI52	Embedded Systems and IoT	PC	3	0	2	5	4	50	50	100
3.		Professional Elective III*	PE	-	-	-	-	3	-	-	100
4.		Professional Elective IV*	PE	-	-	-	-	3	-	-	100
5.		Professional Elective V*	PE	-	-	-	-	3	-	-	100
6.		Professional Elective VI*	PE	-	-	-	-	3	-	-	100
7.		Open Elective - I**	OE	-	-	-	-	3	-	-	100
Mandatory Courses											
8.		Mandatory Course - III&	MC	3	0	0	3	0	100	-	100
Total								23			

* Professional Elective - III to VI shall be chosen from the list of Professional electives (Verticals) offered by same Programme

** Open Elective - I shall be chosen from the list of open electives offered by other Programmes

& Mandatory Course-III is a Non-credit Course (Student shall select one course from the list given under Mandatory Course-III)

@ The students individually undergo training in reputed Firms/Research Institutes/ Laboratories for the specified duration (04 weeks) during VI semester summer vacation. After completion of training, a detailed report should be submitted within ten days from the commencement of VII semester.



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE
(Autonomous)
Gobichettipalayam, Erode -638455

Regulation 2023 (UG)
Curriculum and Syllabus
BE-Computer Science and Engineering

SEMESTER VII

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23UHV71	Human Values and Ethics	HSS	2	0	0	2	2	40	60	100
2.		Elective - Management [#]	HSS	3	0	0	3	3	40	60	100
3.		Open Elective - II**	OE	-	-	-	-	3	-	-	100
4.		Open Elective - III**	OE	-	-	-	-	3	-	-	100
5.		Open Elective - IV**	OE	-	-	-	-	3	-	-	100
Practicals											
6.	23CSL71	Summer internship [@]	EEC	0	0	0	0	2	100	-	100
7.	23CSL72	Mini Project	EEC	0	0	4	4	2	40	60	100
Total				14	0	4	18	18			

Elective - Management shall be chosen from the list of Elective Management courses.

**** Open Elective - II to IV Shall be chosen from the list of open electives offered by other Programmes**

@ - The students undergone summer internship during VI semester summer vacation and same will be evaluated in VII semester.

SEMESTER VIII											
S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Practicals											
1.	23CSL81	Project Work	EEC	0	0	20	20	10	40	60	100
Total				0	0	20	20	10			

TOTAL CREDITS: 164



MANDATORY COURSES II

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MCT51	Introduction to Women and Gender Studies	MC	3	0	0	3	0	100	-	100
2.	23MCT52	Elements of Literature	MC	3	0	0	3	0	100	-	100
3.	23MCT53	Film Appreciation	MC	3	0	0	3	0	100	-	100
4.	23MCT54	Disaster Risk Reduction and Management	MC	3	0	0	3	0	100	-	100

MANDATORY COURSES III

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MCT61	Well Being with Traditional Practices -Yoga, Ayurveda and Siddha	MC	3	0	0	3	0	100	-	100
2.	23MCT62	History of Science and Technology in India	MC	3	0	0	3	0	100	-	100
3.	23MCT63	Political and Economic Thought for a Humane Society	MC	3	0	0	3	0	100	-	100
4.	23MCT64	State, Nation Building and Politics in India	MC	3	0	0	3	0	100	-	100
5.	23MCT65	Industrial Safety	MC	3	0	0	3	0	100	-	100

ELECTIVE - MANAGEMENT COURSES

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MSE71	Principles of Management	HSS	3	0	0	3	3	40	60	100
2.	23MSE72	Total Quality Management	HSS	3	0	0	3	3	40	60	100
3.	23MSE73	Engineering Economics and Financial Accounting	HSS	3	0	0	3	3	40	60	100
4.	23MSE74	Human Resource Management	HSS	3	0	0	3	3	40	60	100
5.	23MSE75	Knowledge Management	HSS	3	0	0	3	3	40	60	100
6.	23MSE76	Industrial Management	HSS	3	0	0	3	3	40	60	100

PROFESSIONAL ELECTIVE COURSES: VERTICALS

Vertical I Data Science	Vertical II Full Stack Development	Vertical III Cloud Computing and Data Center Technologies	Vertical IV Cyber Security and Data Privacy	Vertical V Creative Media	Vertical VI Emerging Technologies	Vertical VII Artificial Intelligence and Machine Learning
Exploratory Data Analysis	Web Technologies	Cloud Computing	Ethical Hacking	Augmented Reality/Virtual Reality	Augmented Reality/Virtual Reality	Knowledge Engineering
Recommender Systems	App Development	Virtualization	Digital and Mobile Forensics	Multimedia and Animation	Robotic Process Automation	Soft Computing
Neural Networks and Deep Learning	Cloud Services Management	Cloud ServicesManagement	Social NetworkSecurity	Video Creationand Editing	Neural Networks and Deep Learning	Neural Networks and Deep Learning
Text and Speech Analysis	UI and UX Design	Data Warehousing	Modern Cryptography	UI and UX Design	Cyber security	Text and Speech Analysis
Business Analytics	Software Testing and Automation	Storage Technologies	Engineering Secure Software Systems	Digital marketing	Quantum Computing	Optimization Techniques
Image and Video Analytics	Web Application Security	Software DefinedNetworks	Cryptocurrency and Blockchain Technologies	Visual Effects	Cryptocurrency and Blockchain Technologies	Game Theory
Computer Vision	DevOps	Stream Processing	Network Security	Game Development	Game Development	Cognitive Science
Big Data Analytics	Principles of Programming Languages	Security and Privacy in Cloud	Security and Privacy in Cloud	Multimedia Data Compression and Storage	3D Printing andDesign	Ethics And AI

Registration of Professional Elective Courses from Verticals:

Professional Elective Courses will be registered in Semesters V and VI. These courses are listed in groups called verticals that represent a particular area of specialization / diversified group. Students are permitted to choose all the Professional Electives from a particular vertical or from different verticals. Further, only one Professional Elective course shall be chosen in a semester horizontally (row-wise). However, two courses are permitted from the same row, provided one course is enrolled in Semester V and another in semester VI.

The registration of courses for B.E./B.Tech (Honours) or Minor degree shall be done from Semester V to VIII. The procedure for registration of courses explained above shall be followed for the courses of B.E./B.Tech (Honours) or Minor degree also. For more details on B.E./B.Tech (Honours) or Minor degree refer to the Regulations 2023 (Clause 12).

PROFESSIONAL ELECTIVE COURSES: VERTICALS**VERTICAL 1: DATA SCIENCE**

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CSE11	Exploratory Data Analysis	PE	2	0	2	4	3	50	50	100
2.	23CSE12	Recommender Systems	PE	2	0	2	4	3	50	50	100
3.	23CSE13	Neural Networks and Deep Learning	PE	2	0	2	4	3	50	50	100
4.	23CSE14	Text and Speech Analysis	PE	2	0	2	4	3	50	50	100
5.	23CSE15	Business Analytics	PE	2	0	2	4	3	50	50	100
6.	23CSE16	Image and Video Analytics	PE	2	0	2	4	3	50	50	100
7.	23CSE17	Computer Vision	PE	2	0	2	4	3	50	50	100
8.	23CSE18	Big Data Analytics	PE	2	0	2	4	3	50	50	100

VERTICAL 2: FULL STACK DEVELOPMENT

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CSE21	Web Technologies	PE	2	0	2	4	3	50	50	100
2.	23CSE22	App Development	PE	2	0	2	4	3	50	50	100
3.	23CSE23	Cloud Services Management	PE	2	0	2	4	3	50	50	100
4.	23CSE24	UI and UX Design	PE	2	0	2	4	3	50	50	100
5.	23CSE25	Software Testing and Automation	PE	2	0	2	4	3	50	50	100
6.	23CSE26	Web Application Security	PE	2	0	2	4	3	50	50	100
7.	23CSE27	DevOps	PE	2	0	2	4	3	50	50	100
8.	23CSE28	Principles of Programming Languages	PE	3	0	0	3	3	40	60	100

VERTICAL 3: CLOUD COMPUTING AND DATA CENTER TECHNOLOGIES

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CSE31	Cloud Computing	PE	2	0	2	4	3	50	50	100
2.	23CSE32	Virtualization	PE	2	0	2	4	3	50	50	100
3.	23CSE23	Cloud Services Management	PE	2	0	2	4	3	50	50	100
4.	23CSE34	Data Warehousing	PE	2	0	2	4	3	50	50	100
5.	23CSE35	Storage Technologies	PE	3	0	0	3	3	40	60	100
6.	23CSE36	Software Defined Networks	PE	2	0	2	4	3	50	50	100
7.	23CSE37	Stream Processing	PE	2	0	2	4	3	50	50	100
8.	23CSE38	Security and Privacy in Cloud	PE	2	0	2	4	3	50	50	100

VERTICAL 4: CYBER SECURITY AND DATA PRIVACY

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CSE41	Ethical Hacking	PE	2	0	2	4	3	50	50	100
2.	23CSE42	Digital and Mobile Forensics	PE	2	0	2	4	3	50	50	100
3.	23CSE43	Social Network Security	PE	2	0	2	4	3	50	50	100
4.	23CSE44	Modern Cryptography	PE	2	0	2	4	3	50	50	100
5.	23CSE45	Engineering Secure Software Systems	PE	2	0	2	4	3	50	50	100
6.	23CSE46	Cryptocurrency and Blockchain Technologies	PE	2	0	2	4	3	50	50	100
7.	23CSE47	Network Security	PE	2	0	2	4	3	50	50	100
8.	23CSE38	Security and Privacy in Cloud	PE	2	0	2	4	3	50	50	100

VERTICAL 5: CREATIVE MEDIA

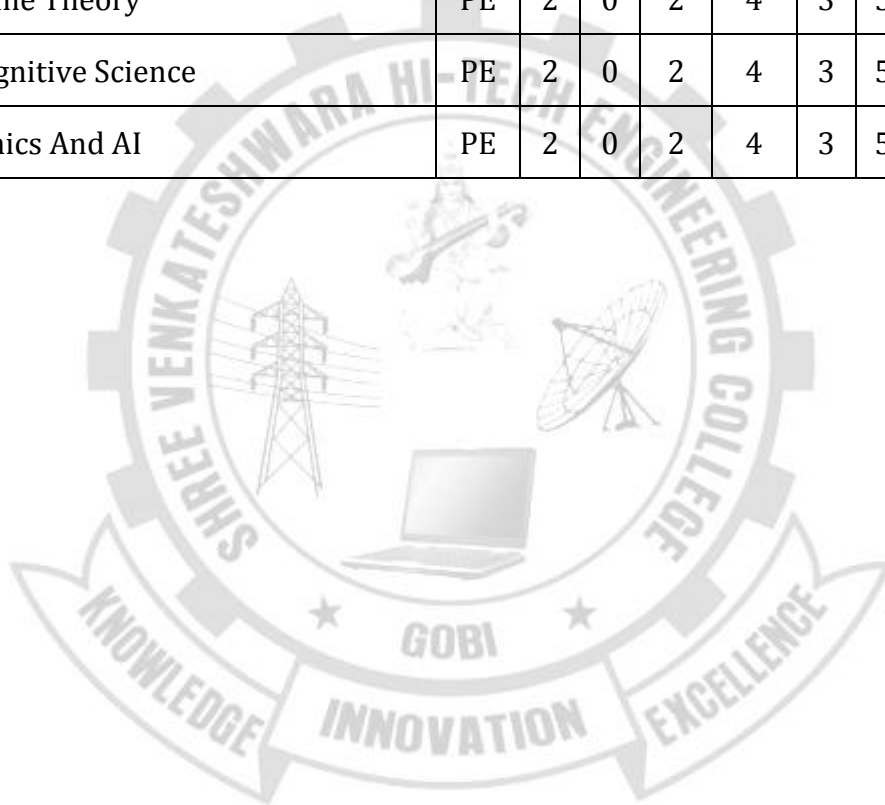
S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CSE51	Augmented Reality/Virtual Reality	PE	2	0	2	4	3	50	50	100
2.	23CSE52	Multimedia and Animation	PE	2	0	2	4	3	50	50	100
3.	23CSE53	Video Creation and Editing	PE	2	0	2	4	3	50	50	100
4.	23CSE24	UI and UX Design	PE	2	0	2	4	3	50	50	100
5.	23CSE55	Digital marketing	PE	2	0	2	4	3	50	50	100
6.	23CSE56	Visual Effects	PE	2	0	2	4	3	50	50	100
7.	23CSE57	Game Development	PE	2	0	2	4	3	50	50	100
8.	23CSE58	Multimedia Data Compression and Storage	PE	2	0	2	4	3	50	50	100

VERTICAL 6: EMERGING TECHNOLOGIES

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CSE51	Augmented Reality/Virtual Reality	PE	2	0	2	4	3	50	50	100
2.	23CSE62	Robotic Process Automation	PE	2	0	2	4	3	50	50	100
3.	23CSE13	Neural Networks and Deep Learning	PE	2	0	2	4	3	50	50	100
4.	23CSE64	Cyber security	PE	2	0	2	4	3	50	50	100
5.	23CSE65	Quantum Computing	PE	2	0	2	4	3	50	50	100
6.	23CSE46	Cryptocurrency and Blockchain Technologies	PE	2	0	2	4	3	50	50	100
7.	23CSE57	Game Development	PE	2	0	2	4	3	50	50	100
8.	23CSE68	3D Printing and Design	PE	2	0	2	4	3	50	50	100

VERTICAL 7: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CSE71	Knowledge Engineering	PE	2	0	2	4	3	50	50	100
2.	23CSE72	Soft Computing	PE	2	0	2	4	3	50	50	100
3.	23CSE13	Neural Networks and Deep Learning	PE	2	0	2	4	3	50	50	100
4.	23CSE14	Text and Speech Analysis	PE	2	0	2	4	3	50	50	100
5.	23CSE75	Optimization Techniques	PE	2	0	2	4	3	50	50	100
6.	23CSE76	Game Theory	PE	2	0	2	4	3	50	50	100
7.	23CSE77	Cognitive Science	PE	2	0	2	4	3	50	50	100
8.	23CSE78	Ethics And AI	PE	2	0	2	4	3	50	50	100



OPEN ELECTIVES

Sl. No	Course Code	Course Title	Category	Periods /Week			Total Contact Periods	Credits	Max. Marks		
				L	T	P			CA	ES	TM
OFFERED BY DEPARTMENT OF CIVIL ENGINEERING											
1	23CE011	Civil and Infrastructure Engineering	OE	3	0	0	3	3	40	60	100
2	23CE012	Environmental Pollution and waste management	OE	3	0	0	3	3	40	60	100
3	23CE013	Environmental Impact Assessment	OE	3	0	0	3	3	40	60	100
4	23CE014	Building Services	OE	3	0	0	3	3	40	60	100
5	23CE015	Water, Sanitation and Health	OE	3	0	0	3	3	40	60	100
OFFERED BY DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING											
1	23CS011	Foundation of AR/VR	OE	2	0	2	4	3	50	50	100
2	23CS012	Web Designing	OE	2	0	2	4	3	50	50	100
3	23CS013	Block Chain fundamentals	OE	2	0	2	4	3	50	50	100
4	23CS014	Knowledge Management	OE	2	0	2	4	3	50	50	100
5	23CS015	Cloud Computing Essentials	OE	2	0	2	4	3	50	50	100
OFFERED BY DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING											
1	23EC011	Basics of electronics in automation	OE	3	0	0	3	3	40	60	100
2	23EC012	Optical engineering	OE	3	0	0	3	3	40	60	100
3	23EC013	E-waste management	OE	3	0	0	3	3	40	60	100
4	23EC014	Consumer electronics	OE	3	0	0	3	3	40	60	100
5	23EC015	Principles of communication engineering	OE	3	0	0	3	3	40	60	100
OFFERED BY DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING											
1	23EE011	Renewable Energy Sources	OE	3	0	0	3	3	40	60	100
2	23EE012	Electrical Vehicle	OE	3	0	0	3	3	40	60	100
3	23EE013	Energy Auditing and Conservation	OE	3	0	0	3	3	40	60	100
4	23EE014	Domestic and Industrial Electrical Installations	OE	3	0	0	3	3	40	60	100
5	23EE015	Microcontroller Based System Design	OE	3	0	0	3	3	40	60	100
OFFERED BY DEPARTMENT OF MECHANICAL ENGINEERING											
1.	23ME011	Industrial Instrumentation	OE	3	0	0	3	3	40	60	100
2.	23ME012	Energy Technology	OE	3	0	0	3	3	40	60	100

3.	23ME013	Reverse Engineering	OE	3	0	0	3	3	40	60	100
4.	23ME014	Fire Safety Engineering	OE	3	0	0	3	3	40	60	100
5.	23ME015	Nano Technology	OE	3	0	0	3	3	40	60	100
6.	23ME016	Entrepreneurship Development	OE	3	0	0	3	3	40	60	100

OFFERED BY DEPARTMENT ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

1	23AD011	Introduction to Big Data	OE	2	0	2	4	3	50	50	100
2	23AD012	Principles of Data Science	OE	2	0	2	4	3	50	50	100
3	23AD013	Data Visualization and its Applications	OE	2	0	2	4	3	50	50	100
4	23AD014	Data Warehousing and Mining	OE	2	0	2	4	3	50	50	100
5	23AD015	Principles of Cyber Security	OE	2	0	2	4	3	50	50	100

OFFERED BY DEPARTMENT INFORMATION TECHNOLOGY

1	23IT011	Basics of Java Programming	OE	2	0	2	4	3	50	50	100
2	23IT012	Ethical Hacking	OE	2	0	2	4	3	50	50	100
3	23IT013	E-Commerce and Applications	OE	2	0	2	4	3	50	50	100
4	23IT014	Basics of Android Application Development	OE	2	0	2	4	3	50	50	100
5	23IT015	Introduction to Web Design	OE	2	0	2	4	3	50	50	100

OFFERED BY DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY

1	23PTO11	Nutraceuticals	OE	3	0	0	3	3	40	60	100
2	23PTO12	IPR for Pharma Industry	OE	3	0	0	3	3	40	60	100
3	23PTO13	Pharmaceutical Nanotechnology	OE	3	0	0	3	3	40	60	100
4	23PTO14	Basics of Human Anatomy and physiology	OE	3	0	0	3	3	40	60	100

OFFERED BY DEPARTMENT BIOMEDICAL ENGINEERING

1	23BM011	Biomedical Instrumentation	OE	3	0	0	3	3	40	60	100
2	23BM012	Medical Optics	OE	3	0	0	3	3	40	60	100
3	23BM013	Biometric systems and their applications	OE	3	0	0	3	3	40	60	100
4	23BM014	Healthcare Management systems	OE	3	0	0	3	3	40	60	100
5	23BM015	IOT in Medicine	OE	3	0	0	3	3	40	60	100

23CST11

PROBLEM SOLVING AND PYTHON PROGRAMMING

(BE/B.Tech-Common to all Branches)

L T P C
3 0 0 3

COURSE OBJECTIVES:

- To solve problems using computational thinking methods using pseudo code and flowchart
- To understand the fundamentals of algorithmic problem solving basics and strategies
- To define variables data types and error messages
- To learn to solve problems using Python conditionals loops lists tuples and dictionaries to represent complex data
- To understand the functions modules and do input/output with files in Python

UNIT-I

COMPUTATIONAL THINKING

8

Introduction - Problem solving and Decomposition - Abstraction - Notations Pseudo code - Flow chart - Programming language

UNIT-II

ALGORITHMIC PROBLEM SOLVING

8

Algorithm Implementation - Top down design - Simple strategies for developing algorithms - Iteration - Recursion - Fundamental algorithms - Anticipating and Dealing with Errors

UNIT-III

BASICS BUILDING BLOCKS OF PYTHON

9

Variables - Immutable variables - Data types - Operators - Python Reserved Words - Understanding error messages

UNIT-IV

CONTROL STATEMENTS AND STRUCTURED TYPES

10

Control Flow - Indenting - if Statement - while Loop - break and continue - for Loop - String - Lists - Tuples - Sets - Dictionaries

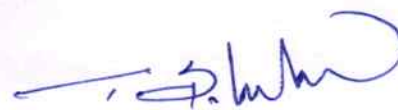
UNIT-V

FUNCTIONS, MODULES AND FILES

10

Definition - Hiding redundancy - Arguments and return values - Variable Number of Arguments - Scope - Passing Functions to a Function - Mapping Functions in a Dictionary - Lambda function - Recursive Functions - Modules: Standard Modules - OS and SYS modules - User defined Modules - Importing modules - Writing into a File - Reading from a File - File Methods

TOTAL : 45 PERIODS


Chairman
BoS/CSE&IT

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1 :** Develop algorithmic solutions for simple computational problems to develop and execute simple Python programs.
- CO2 :** Write the Algorithms for problem solving basics and strategies to solve complex problems
- CO3 :** Compose simple Python programs using to illustrate variables data types and error messages.
- CO4 :** Represent compound data using Python conditionals loops lists tuples dictionaries for solving problems
- CO5 :** Create functions modules read and write data from/to files in Python programs.

TEXT BOOKS:

1. R. G. Dromey "How to Solve it by Computer", Pearson Education., 2015
2. Charles Dierbach "Introduction to Computer Science using Python: A Computational Problem- Solving Focus", Wiley India., 2015

REFERENCE BOOKS:

1. John V. Guttag "Introduction to Computation and Programming using Python", The MIT press. 2021 (3rd Edition).
2. Paul Gries, Jennifer Campbell, Jason Montojo "Practical Programming: An Introduction to Computer Science using Python 3", Pragmatic Programmers., 2013 , Second edition
3. Robert Sedgewick, Kevin Wayne, Robert Dondero "Introduction to Programming in Python: An Inter-disciplinary Approach", Pearson India., 2016
4. Karl Beecher "Computational Thinking - A beginner's guide to problem solving and Programming", BCS Learning &Development., 2017

E-RESOURCES:

1. <http://www.flowgorithm.org/>
2. <https://www.python.org/>
3. <https://nptel.ac.in/courses/106104074>

CO's - PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3
CO2	2	3	3	3	2	-	-	-	-	-	2	-	3	3	3
CO3	2	2	-	2	2	-	-	-	-	-	1	-	3	3	3
CO4	1	2	-	-	1	-	-	-	-	-	1	-	2	3	3
CO5	2	2	-	-	2	-	-	-	-	-	1	2	2	3	3
AVG	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation

23CSL11	PROBLEM SOLVING AND PYTHON PROGRAMMING	L	T	P	C
	LABORATORY (BE/B.Tech - Common to all Branches)	0	0	4	2

COURSE OBJECTIVES:

- To understand the problem solving approaches.
- To learn the basic programming constructs in Python.
- To practice various computing strategies for Python-based solutions to real world problems.
- To use Python data structures - lists, tuples, dictionaries.
- To do input/output with files in Python

LIST OF EXPERIMENTS

Note: The examples suggested in each experiment are only indicative. The lab instructor is expected to design other problems on similar lines. The Examination shall not be restricted to the sample experiments listed here.

1. Identification and solving of simple real life or scientific or technical problems, and developing flow charts for the same. (Electricity Billing, Retail shop billing, Sin series, weight of a motorbike, Weight of a steel bar, compute Electrical Current in Three Phase AC Circuit, etc.)
2. Python programming using simple statements and expressions (exchange the values of two variables, circulate the values of n variables, distance between two points).
3. Scientific problems using Conditionals and Iterative loops. (Number series, Number Patterns, pyramid pattern)
4. Implementing real-time/technical applications using Lists, Tuples. (Items present in a library/Components of a car/ Materials required for construction of a building -operations of list & tuples)
5. Implementing real-time/technical applications using Sets, Dictionaries. (Language, components of an automobile, Elements of a civil structure, etc.- operations of Sets & Dictionaries)
6. Implementing programs using Functions. (Factorial, largest number in a list, area of shape)
7. Implementing programs using Strings. (reverse, palindrome, character count, replacing characters)
8. Implementing programs using written modules and Python Standard Libraries (pandas, numpy, Matplotlib, scipy)
9. Implementing real-time/technical applications using File handling. (copy from one file to another, word count, longest word)
10. Implementing real-time/technical applications using Exception handling. (divide by zero error, voter's age validity, student mark range validation)
11. Exploring Pygame tool.
12. Developing a game activity using Pygame like bouncing ball, car race etc.

TOTAL : 60 PERIODS


Chairman
BoS/CSE&IT

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1 :** Develop algorithmic solutions to simple computational problems
- CO2 :** Develop and execute simple Python programs.
- CO3 :** Implement programs in Python using conditionals and loops for solving problems.
- CO4 :** Deploy functions to decompose a Python program.
- CO5 :** Process compound data using Python data structures and Utilize Python packages in developing software applications.

TEXT BOOKS:

1. Allen B. Downey, "Think Python: How to Think like a Computer Scientist", 2nd Edition, O'Reilly Publishers, 2016.
2. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and Programming", 1st Edition, BCS Learning & Development Limited, 2017.

REFERENCE BOOKS:

1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.
2. G Venkatesh and Madhavan Mukund, "Computational Thinking: A Primer for Programmers and Data Scientists", 1st Edition, Notion Press, 2021.
3. John V Guttag, "Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data", Third Edition, MIT Press, 2021.
4. Eric Matthes, "Python Crash Course, A Hands - on Project Based Introduction to Programming", 2nd Edition, No Starch Press, 2019.
5. Martin C. Brown, "Python: The Complete Reference", 4th Edition, Mc-Graw Hill, 2018.

E-RESOURCES:

1. <http://www.flowgorithm.org/>
2. <https://www.python.org/>
3. <https://nptel.ac.in/courses/106104074>

CO's - PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	2	-	-	-	-	-	2	2	3	3	3
CO2	3	3	3	3	2	-	-	-	-	-	2	-	3	3	
CO3	2	2	-	2	2	-	-	-	-	-	1	-	3	3	3
CO4	1	2	-	-	1	-	-	-	-	-	1	-	2	3	3
CO5	2	2	-	-	2	-	-	-	-	-	1	-	2	3	3
AVG	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation

23CST23

PROGRAMMING IN C
(Common to CSE,IT,AI&DS Branches)

L T P C
3 0 0 3

COURSE OBJECTIVES:

- To understand the constructs of C Language and to develop C Programs using basic programming constructs.
- To develop C programs using arrays and strings
- To develop modular applications in C using functions
- To develop applications in C using pointers and structures.
- To do input/output and file handling in C.

UNIT-I

BASICS OF C PROGRAMMING

8

Introduction to programming paradigms – Applications of C Language - Structure of C program - C programming: Data Types - Constants – Enumeration Constants - Keywords – Operators: Precedence and Associativity - Expressions - Input/Output statements, Assignment statements – Decision making statements - Switch statement - Looping statements – Preprocessor directives - Compilation process

UNIT-II

ARRAYS AND STRINGS

9

Introduction to Arrays: Declaration, Initialization – One dimensional array –Two dimensional arrays - String operations: length, compare, concatenate, copy – Selection sort, linear and binary search.

UNIT-III

FUNCTIONS AND POINTERS

10

Modular programming - Function prototype, function definition, function call, Built-in functions (string functions, math functions) – Recursion, Binary Search using recursive functions –Pointers – Pointer operators – Pointer arithmetic – Arrays and pointers – Array of pointers – Parameter passing: Pass by value, Pass by reference.

UNIT-IV

STRUCTURES AND UNION

10

Structure - Nested structures – Pointer and Structures – Array of structures – Self referential structures – Dynamic memory allocation - Singly linked list – typedef – Union - Storage classes and Visibility.

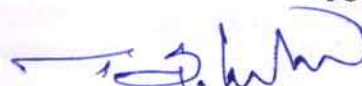
UNIT-V

FILE PROCESSING

8

Files – Types of file processing: Sequential access, Random access – Sequential access file - Random access file - Command line arguments.

TOTAL : 45 PERIODS


Chairman
BoS/CSE&IT

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1 :** Demonstrate knowledge on C Programming constructs and to Develop simple applications in C using basic constructs
- CO2 :** Design and implement applications using arrays and strings
- CO3 :** Develop and implement modular applications in C using functions.
- CO4 :** Develop applications in C using structures and pointers.
- CO5 :** Design applications using sequential and random access file processing.

TEXT BOOKS:

1. ReemaThareja, "Programming in C", Oxford University Press, Second Edition, 2016.
2. Kernighan, B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2015.

REFERENCE BOOKS:

1. Paul Deitel and Harvey Deitel, "C How to Program with an Introduction to C++", Eighth edition, Pearson Education, 2018.
2. Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.
3. Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C", McGraw-Hill Education, 1996.
4. Pradip Dey, Manas Ghosh, "Computer Fundamentals and Programming in C", Second Edition, Oxford University Press, 2013.
5. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", 1st Edition, Pearson Education, 2013.

E-RESOURCES:

1. <https://www.learn-c.org/>

CO's - PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	1	2	1	1	1	2	-	3	3	1	2	2
CO2	2	3	2	1	2	1	1	1	2	-	3	2	2	2	2
CO3	3	2	2	1	3	1	1	1	2	-	3	3	2	2	2
CO4	2	3	3	1	2	1	2	1	2	-	3	2	2	3	2
CO5	2	2	3	2	1	2	-	-	2	1	2	2	2	2	2
AVG	2	2	2	1	2	1	1	1	2	-	3	2	2	2	2

1 - low, 2 - medium, 3 - high, '-' - no correlation


Chairman
BoS/CSE&IT

23CSL23	PROGRAMMING IN C LABORATORY (Common to CSE,IT,AI&DS Branches)	L	T	P	C
		0	0	4	2
COURSE OBJECTIVES:					
<ul style="list-style-type: none"> ➤ To familiarize with C programming constructs to develop programs in C using basic constructs. ➤ To develop programs in C using arrays. ➤ To develop applications in C using strings, pointers, functions. ➤ To develop applications in C using structures. ➤ To develop applications in C using file processing. 					
LIST OF EXPERIMENTS					
<p>Note: The lab instructor is expected to design problems based on the topics listed. The Examination shall not be restricted to the sample experiments designed.</p> <ol style="list-style-type: none"> 1. I/O statements, operators, expressions 2. Decision-making constructs: if-else, goto, switch-case, break-continue 3. Loops: for, while, do-while 4. Arrays: 1D and 2D, Multi-dimensional arrays, traversal 5. Strings: operations 6. Functions: call, return, passing parameters by (value, reference), passing arrays to function. 7. Recursion 8. Pointers: Pointers to functions, Arrays, Strings, Pointers to Pointers, Array of Pointers 9. Structures: Nested Structures, Pointers to Structures, Arrays of Structures and Unions. 10. Files: reading and writing, File pointers, file operations, random access, processor directives. 					
TOTAL : 60 PERIODS					

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1 :** Demonstrate knowledge on C Programming constructs and Develop programs in C using basic constructs
- CO2 :** Develop programs in C using arrays.
- CO3 :** Develop applications in C using strings, pointers, functions..
- CO4 :** Develop applications in C using structures..
- CO5 :** Develop applications in C using file processing.


Chairman
BoS/CSE&IT

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

TEXT BOOKS:

1. ReemaThareja, "Programming in C", Oxford University Press, Second Edition, 2016.
2. Kernighan, B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2015.

REFERENCE BOOKS:

1. Paul Deitel and Harvey Deitel, "C How to Program with an Introduction to C++", Eighth edition, Pearson Education, 2018.
2. Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.
3. Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C", McGraw-Hill Education, 1996.
4. Pradip Dey, Manas Ghosh, "Computer Fundamentals and Programming in C", Second Edition, Oxford University Press, 2013.
5. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", 1st Edition, Pearson Education, 2013.

E-RESOURCES:

1. <https://www.learn-c.org/>

CO's - PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	2	1	1	-	-	2	1	2	2	2	3	2
CO2	2	2	2	1	1	2	-	-	2	-	2	2	2	2	2
CO3	2	2	2	2	1	2	-	-	3	-	3	3	3	2	2
CO4	2	2	3	2	3	2	-	-	3	-	3	3	3	3	2
CO5	2	2	3	2	1	2	-	-	2	1	2	2	2	2	2
AVG	2	2	3	2	1	2	-	-	2	1	2	2	2	2	2

1 - low, 2 - medium, 3 - high, '-' - no correlation


Chairman
BoS/CSE&IT