

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



Regulation 2023 (Autonomous)

Curriculum and Syllabus

Choice Based Credit System (CBCS)

B.Tech.-Artificial Intelligence and Data Science



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

Regulation 2023 (UG)

Curriculum and Syllabus

B.Tech. – Artificial Intelligence and Data Science

I. Program Educational Objective (PEO)

- PEO1 : Basic Skills :** Utilize their proficiencies in the fundamental knowledge of basic sciences, mathematics, Artificial Intelligence, data science and statistics to build systems that require management and analysis of large volumes of data.
- PEO2 : Technical Skills :** Advance their technical skills to pursue pioneering research in the field of AI and Data Science and create disruptive and sustainable solutions for the welfare of ecosystems.
- PEO3 : Multi-Disciplinary & Managerial Skills :** Pursue lifelong learning and collaborate with an ethical attitude in a multidisciplinary team and Design and model AI based solutions to critical problem domains in the real world.

II. Program Outcomes (POs)

- Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 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.
- 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.
- 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.
- 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.
- 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.

Chairman
BOS/CSE&IT

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)

- PSO1 : Computing Solutions:** Create, select and apply the theoretical knowledge of AI and Data Analytics along with practical industrial tools and techniques to manage and solve societal problems.
- PSO2 : Professional Practice:** Develop data analytics and data visualization skills, skills pertaining to knowledge acquisition, knowledge representation and knowledge engineering, and hence be capable of coordinating complex projects.
- PSO3 : Emerging Technologies:** Able to carry out fundamental research to cater the critical needs of the society through cutting edge technologies of AI arrive at Foresight, Insight, hindsight from data for solving business and engineering problems.


Chairman
BoS/CSE&IT

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		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	-	-	-	-	-	1	1	1	-	1	-	-	-	-	-
		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	-	-	-
II		English Laboratory	-	-	-	-	-	-	-	1	3	3	-	2	-	-	-
		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	2	-	-	-	-	2	2	2	2	2	-	2	-	-	-
		Engineering Practices Laboratory	3	-	-	3	-	-	-	-	-	-	-	-	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	-	-	-
		Mandatory Course - I Yoga for Human Excellence	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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


Chairman
 BoS/CSE&IT

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
II	III	Discrete Mathematics	3	3	2	2	-	2	-	-	-	2	-	2	-	-	-
		Foundations of Data Science	2	2	1	2	2	1	1	-	1	1	1	2	2	2	2
		Data Structures and Algorithms	2.2	2.6	2.6	2.6	1.6	-	-	-	3	-	2	2	3	2	2
		Data Exploration and Visualization	2	1	2	2	1	-	-	-	2	2	2	2	2	2	2
		Digital Principles and Computer Organization	3	3	3	3	1.8	1.6	1	1	1	1	1.6	2.6	1.4	2.6	1.6
		Entrepreneurship and Startup	2	2	2	1.6	1	-	-	-	-	-	-	-	2	2	2
		Data Science Laboratory	2	2	2	2	1	-	-	-	2	2	2	2	2	3	2
		Data Structures and Algorithms Laboratory	2.8	1.8	1.8	0.8	1	-	-	-	2	3	1	2	1.2	2.6	1
	IV	Probability and Linear Algebra	3	3	3	-	-	-	-	-	2	-	-	1	-	-	-
		Machine Learning	2	2	3	2	2	-	-	-	2	2	2	2	2	2	1
		Database Design and Management	2	2	2	2	1	-	-	-	2	2	1	1	2	2	2
		Artificial Intelligence	2	1	2	2	1	-	-	-	2	2	2	2	2	2	2
		Operating Systems	2	2	2	2	1	-	-	-	2	2	2	2	2	1	2
		Environmental Sciences and Sustainability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Machine Learning Laboratory	2	2	2	2	2	-	-	-	2	2	2	2	2	2	2
		Database Design and Management Laboratory	2	2	2	2	1	-	-	-	2	2	2	2	2	2	2
		Artificial Intelligence Laboratory	2	1	2	2	1	-	-	-	2	2	2	2	2	2	2
		Mandatory Course - II Soft and Analytical Skills-I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Chairman
BoS/CSE&IT

SUMMARY OF CREDITS

S.No	Course Category	Credits per Semester								Total Credits	Credits in %	Credits as per AU Curriculum R21	Credits as per AICTE Model Curriculum 2022
		I	II	III	IV	V	VI	VII	VIII				
1	HSS	4	3					5		12	7.27	12	12
2	BS	12	7	4	6					29	17.57	29	25
3	ES	5	9							14	8.48	14	24
4	PC		5	18	17.5	14.5	7			62	37.57	62	48
5	PE					6	12			18	10.90	18	18
6	OE						3	9		12	7.27	12	18
7	EEC	1	2	1		0		4	10	18	10.90	16	15
8	MC		√		√	√	√						-
Total Credits / Semester		22	26	23	23.5	20.5	22	18	10	165	100	163	163

CATEGORIZATION OF COURSES

- Humanities and Social Sciences including Management Courses (HSS)
- Basic Science Courses (BS)
- Engineering Science Courses (ES)
- Professional Core Courses (PC)
- Professional Elective Courses (PE)
- Open Elective Courses (OE)
- Mandatory Courses (MC)
- Employability Enhancement Courses (EEC)
- 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,


Chairman
 BoS/CSE&IT



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE (Autonomous)

Gobichettipalayam, Erode -638455


Regulation 2023 (UG)

Curriculum and Syllabus

B.Tech. - Artificial Intelligence and Data Science

SEMESTER I

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			


Chairman
BoS/CSE&IT



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

Regulation 2023 (UG)
Curriculum and Syllabus
B.Tech. – Artificial Intelligence and Data Science

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 /Tamils 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.	23MDC21	Mandatory Course - I Yoga for Human Excellence	MC	0	0	1	1	0	100	-	100
Total				17	1	17	35	26			


Chairman
BoS/CSE&IT



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

Regulation 2023 (UG)

Curriculum and Syllabus

B.Tech. – Artificial Intelligence and Data Science

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.	23ITT31	Data Structures and Algorithms	PC	3	0	0	3	3	40	60	100
4.	23ADI31	Data Exploration and Visualization	PC	3	0	2	5	4	50	50	100
5.	23ECI32	Digital Principles and Computer Organization	PC	3	0	2	5	4	50	50	100
6.	23EST31	Entrepreneurship and Startup	EEC	1	0	0	1	1	100	-	100
Practicals											
7.	23CSL31	Data Science Laboratory	PC	0	0	4	4	2	60	40	100
8.	23ITL31	Data Structures and Algorithms Laboratory	PC	0	0	4	4	2	60	40	100
Total				16	1	12	29	23			

[Signature]
Chairman
BoS/CSE&IT

**SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE****(Autonomous)****Gobichettipalayam, Erode -638455****Regulation 2023 (UG)****Curriculum and Syllabus****B.Tech. – Artificial Intelligence and Data Science****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.	23MAT42	Probability and Linear Algebra	BS	3	1	0	4	4	40	60	100
2.	23ADT41	Machine Learning	PC	3	0	0	3	3	40	60	100
3.	23ADT42	Data Base Design and Management	PC	3	0	0	3	3	40	60	100
4.	23ADT43	Artificial Intelligence	PC	3	0	0	3	3	40	60	100
5.	23CSI41	Operating Systems	PC	3	0	2	5	4	50	50	100
6.	23CYT41	Environmental Sciences and Sustainability	BS	2	0	0	2	2	40	60	100
Practicals											
7.	23ADL41	Machine Learning Laboratory	PC	0	0	3	3	1.5	60	40	100
8.	23ADL42	Database Design and Management Laboratory	PC	0	0	3	3	1.5	60	40	100
9.	23ADL43	Artificial Intelligence Laboratory	PC	0	0	3	3	1.5	60	40	100
Mandatory Courses											
10.	23MDC41	Mandatory Course - II Soft and Analytical Skills-I	MC	1	0	0	1	0	-	-	-
Total				18	1	11	30	23.5			


Chairman
 BoS/CSE&IT



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

Regulation 2023 (UG)
Curriculum and Syllabus
B.Tech. – Artificial Intelligence and Data Science

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.	23ADT51	Deep Learning	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.	23CSE18	Big Data Analytics	PC	2	0	2	4	3	50	50	100
5.		Professional Elective I*	PE	-	-	-		3	-	-	100
6.		Professional Elective II*	PE	-	-	-		3	-	-	100
Practicals											
7.	23ADL51	Deep Learning Laboratory	PC	0	0	3	3	1.5	60	40	100
Mandatory Courses											
8.	23MDC51	Mandatory Course – III Soft and Analytical Skills-II	MC	1	0	0	1	0	-	-	-
9.		Mandatory Course – IV*	MC	3	0	0	3	0	100	-	100
Total				-	-	-	-	20.5			

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

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


Chairman
 BoS/CSE&IT



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

Regulation 2023 (UG)

Curriculum and Syllabus

B.Tech. – Artificial Intelligence and Data Science

SEMESTER VI

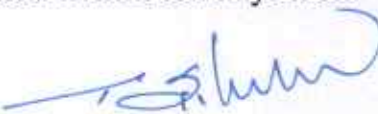
S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23ECI62	Embedded Systems and IoT	PC	3	0	2	5	4	50	50	100
2.	23ADT61	Data and Information Security	PC	3	0	0	3	3	40	60	100
3.		Professional Elective III*	PE	-	-	-	-	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											
8.	23MCT61	Mandatory Course-V*	MC	3	0	0	3	0	100	-	100
Total				-	-	-	-	22			

* 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-V is a Non-credit Course (Student shall select one course from the list of given under Mandatory Course-V)

@ The students individually undergo training in reputed Firms/Research Institute/ 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.


Chairman
BoS/CSE&IT


SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE
(Autonomous)
Gobichettipalayam, Erode -638455
Regulation 2023 (UG)
Curriculum and Syllabus
B.Tech. – Artificial Intelligence and Data Science
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.	23ADL71	Summer internship [@]	EEC	0	0	0	0	2	100	-	100
7.	23ADL72	Mini Project	EEC	0	0	4	4	2	40	60	100
Total				-	-	-	-	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.

(Signature)
Chairman
 BoS/CSE&IT



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

Regulation 2023 (UG)

Curriculum and Syllabus

B.Tech. – Artificial Intelligence and Data Science

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.	23ADL81	Project Work	EEC	0	0	20	20	10	60	40	100
Total				0	0	20	20	10			

TOTAL CREDITS: 165




Chairman
 BoS/CSE&IT

MANDATORY COURSES IV

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MDC52	Introduction to Women and Gender Studies	MC	3	0	0	3	0	100	-	100
2.	23MDC53	Elements of Literature	MC	3	0	0	3	0	100	-	100
3.	23MDC54	Film Appreciation	MC	3	0	0	3	0	100	-	100
4.	23MDC55	Disaster Risk Reduction and Management	MC	3	0	0	3	0	100	-	100

MANDATORY COURSES V

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MDC61	Well Being with Traditional Practices -Yoga, Ayurveda and Siddha	MC	3	0	0	3	0	100	-	100
2.	23MDC62	History of Science and Technology in India	MC	3	0	0	3	0	100	-	100
3.	23MDC63	Political and Economic Thought for a Humane Society	MC	3	0	0	3	0	100	-	100
4.	23MDC64	State, Nation Building and Politics in India	MC	3	0	0	3	0	100	-	100
5.	23MDC65	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

Chairman
BoS/CSE&IT


PROFESSIONAL ELECTIVE COURSES: VERTICALS

Vertical for AIDS I	Vertical II Full Stack Development for IT	Vertical III Cloud Computing and Data Center Technologies	Vertical IV Cyber Security and Data Privacy	Vertical V Creative Media	Vertical VI Emerging Technologies	Vertical for AIDS II
Knowledge Engineering	Cloud Computing	Cloud Computing	Ethical Hacking	Augmented Reality/Virtual Reality	Augmented Reality/Virtual Reality	Bio-Inspired Optimization Techniques
Recommender Systems	App Development	Virtualization	Digital and Mobile Forensics	Multimedia and Animation	Robotic Process Automation	App Development
Soft Computing	Cloud Services Management	Cloud Services Management	Social Network Security	Video Creation and Editing	Neural Networks and Deep Learning	Health Care Analytics
Text and Speech Analysis	UI and UX Design	Data Warehousing	Modern Cryptography	UI and UX Design	Cyber security	Cyber security
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 Defined Networks	Cryptocurrency and Blockchain Technologies	Multimedia Data Compression and Storage	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	Visual Effects	3D Printing and Design	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 specialisation / 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).



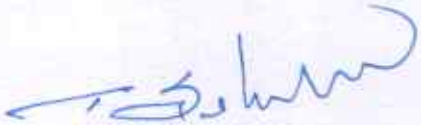
Chairman
Bos/CSE & IT

PROFESSIONAL ELECTIVE COURSES: VERTICALS**VERTICAL 1: AIDS I**

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.	23CSE12	Recommender Systems	PE	2	0	2	4	3	50	50	100
3.	23CSE72	Soft Computing	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 for IT

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.	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


Chairman
 BoS/CSE&IT

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


Chairman
 BoS/CSE&IT

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.	23CSE58	Multimedia Data Compression and Storage	PE	2	0	2	4	3	50	50	100
7.	23CSE57	Game Development	PE	2	0	2	4	3	50	50	100
8.	23CSE56	Visual Effects	PE	2	0	2	4	3	50	50	100

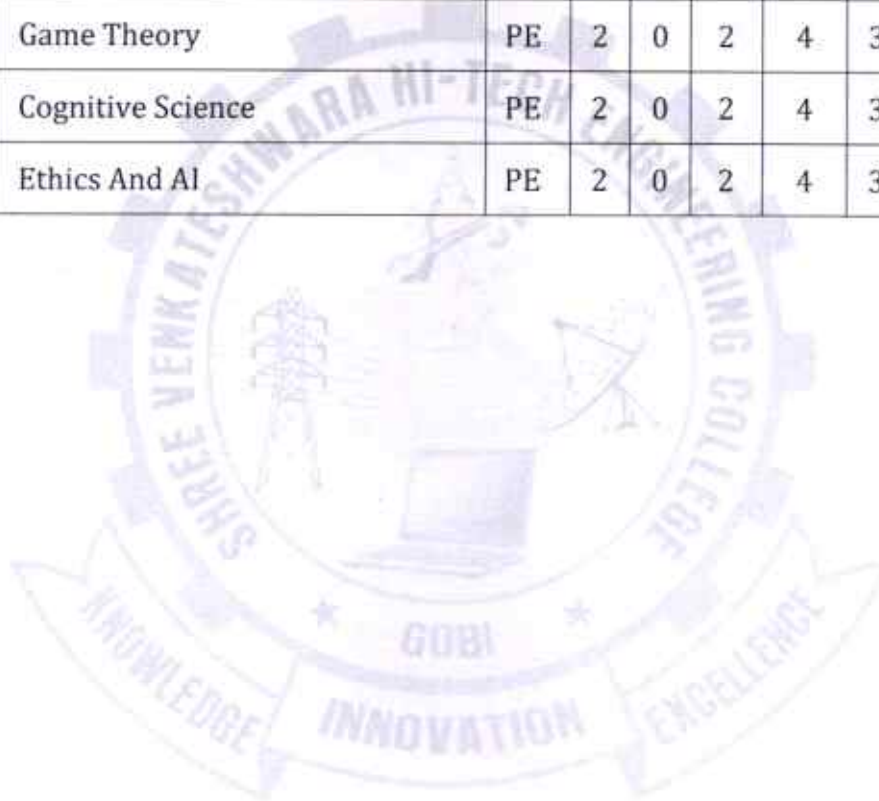
VERTICAL 6: EMERGING TECHNOLOGIES

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

Chairman
BoS/CSE&IT

VERTICAL 7: AIDS II

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
1.	23ADE71	Bio-Inspired Optimization Techniques	PE	2	0	2	4	3	50	50	100
2.	23CSE22	App Development	PE	2	0	2	4	3	50	50	100
3.	23ADE72	Health care Analytics	PE	2	0	2	4	3	50	50	100
4.	23CSE64	Cyber Security	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




Chairman
 BoS/CSE&IT

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	23ECO11	Basics of electronics in automation	OE	3	0	0	3	3	40	60	100
2	23ECO12	Optical engineering	OE	3	0	0	3	3	40	60	100
3	23ECO13	E-waste management	OE	3	0	0	3	3	40	60	100
4	23ECO14	Consumer electronics	OE	3	0	0	3	3	40	60	100
5	23ECO15	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

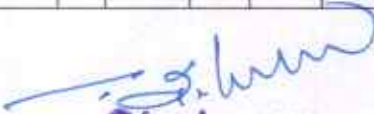
1	23IT011	Basics of Java Programming	OE	2	0	2	4	3	50	50	100
2	23IT012	Ethical Hacking	OE	2	0	2	4	3	50	50	100
3	23IT013	E-Commerce and Applications	OE	2	0	2	4	3	50	50	100
4	23IT014	Basics of Android Application Development	OE	2	0	2	4	3	50	50	100
5	23IT015	Introduction to Web Design	OE	2	0	2	4	3	50	50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

OFFERED BY DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY

1	23PT011	Nutraceuticals	OE	3	0	0	3	3	40	60	100
2	23PT012	IPR for Pharma Industry	OE	3	0	0	3	3	40	60	100
3	23PT013	Pharmaceutical Nanotechnology	OE	3	0	0	3	3	40	60	100
4	23PT014	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


Chairman
BoS/CSE&IT

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23IPA11

**INDUCTION PROGRAMME
(Common to B.E./B.Tech. all Branches)**

**L T P C
- - - 0**

This is a mandatory **2 week programme** to be conducted as soon as the students enter the institution. Normal classes start only after the induction program is over.

The induction programme has been introduced by AICTE with the following objective:

"Engineering colleges were established to train graduates well in the branch/department of admission, have a holistic outlook, and have a desire to work for national needs and beyond. The graduating student must have knowledge and skills in the area of his/her study. However, he/she must also have broad understanding of society and relationships. Character needs to be nurtured as an essential quality by which he/she would understand and fulfill his/her responsibility as an engineer, a citizen and a human being. Besides the above, several meta-skills and underlying values are needed."

"One will have to work closely with the newly joined students in making them feel comfortable, allow them to explore their academic interests and activities, reduce competition and make them work for excellence, promote bonding within them, build relations between teachers and students, give a broader view of life, and build character."

Hence, the purpose of this programme is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature.

The following are the activities under the induction program in which the student would be fully engaged throughout the day for the entire duration of the program.

(i) Physical Activity:

This would involve a daily routine of physical activity with games and sports, yoga, gardening, etc.

(ii) Creative Arts:

Every student would choose one skill related to the arts whether visual arts or performing arts. Examples are painting, sculpture, pottery, music, dance etc. The student would pursue it every day for the duration of the program. These would allow for creative expression. It would develop a sense of aesthetics and also enhance creativity which would, hopefully, grow into engineering design later

(iii) Universal Human Values:

This is the anchoring activity of the Induction Programme. It gets the student to explore oneself and allows one to experience the joy of learning, stand up to peer pressure, take decisions with courage, be aware of relationships with colleagues and supporting stay in the hostel and department, be sensitive to others, etc. A module in Universal Human Values provides the base. Methodology of teaching this content is extremely important. It must not be through do's and don't's, but get students to explore and think by engaging them in a dialogue. It is best taught through group discussions and real life activities rather than lecturing.

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

Discussions would be conducted in small groups of about 20 students with a faculty mentor each. It would be effective that the faculty mentor assigned is also the faculty advisor for the student for the full duration of the UG programme.

(iv) Literary Activity:

Literary activity would encompass reading, writing and possibly, debating, enacting a play etc.

(v) Proficiency Modules:

This would address some lacunas that students might have, for example, English, computer familiarity etc.

(vi) Lectures by Eminent People:

Motivational lectures by eminent people from all walks of life should be arranged to give the students exposure to people who are socially active or in public life.

(vii) Visits to Local Area:

A couple of visits to the landmarks of the city, or a hospital or orphanage could be organized. This would familiarize them with the area as well as expose them to the under privileged.

(viii) Familiarization to Dept./Branch & Innovations:

They should be told about what getting into a branch or department means what role it plays in society, through its technology. They should also be shown the laboratories, workshops & other facilities.

(ix) Department Specific Activities:

About a week can be spent in introducing activities (games, quizzes, social interactions, small experiments, design thinking etc.) that are relevant to the particular branch of Engineering/Technology/Architecture that can serve as a motivation and kindle interest in building things (become a maker) in that particular field. This can be conducted in the form of a workshop.

For example, CSE and IT students may be introduced to activities that kindle computational thinking, and get them to build simple games. ECE students may be introduced to building simple circuits as an extension of their knowledge in Science, and so on. Students may be asked to build stuff using their knowledge of science.

Induction Programme is totally an activity based programme and therefore there shall be no tests / assessments during this programme.

REFERENCES:

1. Guide to Induction program from AICTE

Handwritten signature
02/09/2023

Shree Venkateshwara HI-Tech Engineering College (Autonomous)

23ENT11

PROFESSIONAL ENGLISH – I
(Common to B.E./B.Tech. all Branches)

L T P C
3 0 0 3

COURSE OBJECTIVES:

- To improve the communicative competence of learners.
- To learn to use basic grammatical structures in suitable contexts.
- To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text.
- To help learners use language effectively in professional contexts.
- To develop learners' ability to read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.

UNIT-I

**INTRODUCTION TO EFFECTIVE COMMUNICATION AND
FUNDAMENTALS OF COMMUNICATION**

10

Introduction to Effective Communication- Barriers of Communication, Seven C's of Effective Communication, Effective Listening, Effective Speaking, Excellence in Reading, Ways to Develop Language and Communication Skills.

Reading- Reading Brochures (Technical Context), Telephone Messages/ Social Media Messages Relevant to Technical Contexts and Emails.

Writing- Writing Emails / Letters Introducing Oneself.

Grammar- Present Tense (Simple and Progressive); Question Types: Wh/ Yes or No/ and Tags.

Vocabulary- Synonyms; One Word Substitution; Abbreviations & Acronyms (as Used in Technical Contexts)

UNIT-II

NARRATION AND SUMMATION

9

Reading - Reading Biographies, Travelogues, Newspaper Reports, Excerpts from Literature, and Travel & Technical Blogs.

Writing - Guided writing, Paragraph Writing, Short Report on an Event (Field Trip etc.)

Grammar - Past Tense (Simple); Subject-Verb Agreement; and Prepositions.

Vocabulary - Word Forms (Pre fixes & Suf ixes); Synonyms and Antonyms; Phrasal Verbs.

UNIT-III

DESCRIPTION OF A PROCESS / PRODUCT

9

Reading - Reading Advertisements, Gadget Reviews; User Manuals.

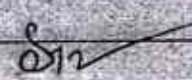
Writing - Writing Definitions; Instructions; and Product /Process Description.

Grammar - Imperatives; Adjectives; Degrees of Comparison; Present & Past Perfect Tenses.

Vocabulary- Compound Nouns, Homonyms; and Homophones, Discourse Markers (Connectives & Sequence Words)

SVHEC -R2023

Chairman
BoS/S&H


Chairman
BoS/S&H

UNIT-IV

CLASSIFICATION AND RECOMMENDATIONS

9

Reading - Newspaper Articles; Journal Reports –and Non Verbal Communication (Tables, Pie Charts etc...)

Writing - Note-making / Note-taking (*Study skills to be taught, not tested); Writing Recommendations; Transferring Information from Non Verbal (Chart , Graph etc, to Verbal Mode)

Grammar - Articles; Pronouns - Possessive & Relative Pronouns.

Vocabulary - Collocations; Fixed / Semi Fixed Expressions

UNIT-V

EXPRESSION

8

Reading - Reading Editorials; and Opinion Blogs;

Writing - Essay Writing (Descriptive or Narrative).

Grammar- Future Tenses, Punctuation; Negation (Statements & Questions); and Simple, Compound & Complex Sentences.

Vocabulary - Cause & Effect Expressions – Content vs. Function Words.

TOTAL : 45 PERIODS

COURSE OUTCOMES:

At the end of the Course the students will able to

- CO1:** Use appropriate words in a professional context
- CO2:** Gain understanding of basic grammatical structures and use them in right context
- CO3:** Read and infer the denotative and connotative meanings of technical text
- CO4:** Read and interpret information presented in tables, charts and other graphic forms
- CO5:** Write definitions, descriptions, narrations and essays on various topics


TEXT BOOKS:

1. Department of English, Anna University, "English for Engineers & Technologists" Orient Blackswan Private Ltd, 2020.
2. Dr.Veena Selvam, Dr.Sujatha Priyadarshini, & CO, Department of English, Anna University, "English for Science & Technology" Cambridge University Press, 2021.

REFERENCE BOOKS:

1. Meenakshi Raman & Sangeeta Sharma, "Technical Communication–Principles and Practices", Oxford Univ. Press, New Delhi, 2016.

SVHEC R2023


Chairman
BoS / B&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

- 2 Lakshminarayanan, "A Course Book on Technical English", Scitech Publications (India) Pvt.Ltd. 2012.
- 3 Aysha Viswamohan, "English For Technical Communication (With CD)", Mcgraw Hill Education, ISBN : 0070264244, 2008.
- 4 Effective Communication Skill, Kulbhusan Kumar, R S Salaria, Khanna Publishing House, 2016.

E. RESOURCES:

- <https://learnenglish.britishcouncil.org/>

CO's-PO's MAPPING :

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	2	3	-	3
CO2	-	-	-	-	-	1	-	-	2	3	-	2
CO3	-	-	-	-	-	1	-	-	3	3	-	3
CO4	-	-	-	2	-	-	-	-	3	3	-	3
CO5	-	-	-	-	-	-	-	-	2	3	-	2
AVR	-	-	-	2	-	1	-	-	2	3	-	3

1- Low, 2- Medium, 3-High, "-" No Correlation

Shree Venkateshwara HI-Tech Engineering College (Autonomous)

23MAT11

MATRICES AND CALCULUS
(Common to B.E./B.Tech. all Branches)

L T P C
3 1 0 4

COURSE OBJECTIVES:

- To develop the use of matrix algebra techniques that is needed by engineers for practical applications
- To familiarize the students with differential calculus
- To familiarize the student with functions of several variables. This is needed in many branches of engineering
- To make the students understand various techniques of integration
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their applications

UNIT-I

MATRICES

9+3

Eigenvalues and Eigenvectors of a real matrix - Characteristic equation - Properties of Eigenvalues and Eigenvectors - Cayley - Hamilton theorem - Diagonalization of matrices by orthogonal transformation - Reduction of a quadratic form to canonical form by orthogonal transformation - Nature of quadratic forms - Applications : Stretching of an elastic membrane.

UNIT-II

DIFFERENTIAL CALCULUS

9+3

Representation of functions - Limit of a function - Continuity - Derivatives - Differentiation rules(sum, product, quotient, chain rules) - Implicit differentiation - Applications : Maxima and Minima of functions of one variable.

UNIT-III

FUNCTIONS OF SEVERAL VARIABLES

9+3

Partial differentiation - Homogeneous functions and Euler's theorem - Total derivative - Change of variables - Jacobians - Partial differentiation of implicit functions - Taylor's series for functions of two variables - Applications : Maxima and minima of functions of two variables and Lagrange's method of undetermined multipliers.

UNIT-IV

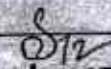
INTEGRAL CALCULUS

9+3

Definite and Indefinite integrals - Substitution rule - Techniques of Integration : Integration by parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction, Improper Integrals - Applications : Hydrostatic force and pressure, moments and centre of mass.

SVHEC-R2023

SVHEC-R2023


Chairman
BoS / S&H

Shree Venkateshwara HI-Tech Engineering College (Autonomous)

UNIT-V

MULTIPLE INTEGRALS

9+3

Double integrals – Change of order of integration – Double Integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of solids – Change of variables in double and triple integrals – Applications: Moments and centre of mass, moment of inertia.

TOTAL : 60 PERIODS

COURSE OUTCOMES:

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

- CO1:** Use the matrix algebra methods for solving practical problems
- CO2:** Apply differential calculus tools in solving various application problems.
- CO3:** Use differential calculus ideas on several variable functions
- CO4:** Apply different methods of integration in solving practical problems
- CO5:** Apply multiple integral ideas in solving areas, volumes and other practical problems

TEXT BOOKS :

1. James Stewart, "Calculus : Early Transcendentals", Cengage Learning, 8th Edition, New Delhi, 2019. [For Units II & IV - Sections 1.1, 2.2, 2.3, 2.5, 2.7 (Tangents problems only), 2.8, 3.1 to 3.6, 3.11, 4.1, 4.3, 5.1 (Area problems only), 5.2, 5.3, 5.4 (excluding net change theorem), 5.5, 7.1 - 7.4 and 7.8]
2. Grewal. B. S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition, 2018

REFERENCE BOOKS :

1. Thomas. G. B., Hass. J, and Weir. M.D, "Thomas Calculus", 14th Edition, Pearson India, 2022
2. Anton. H, Bivens. I and Davis. S, " Calculus ", Wiley, 10th Edition, 2021
3. Jain. R.K. and Iyengar. S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 5th Edition, 2016
4. Ramana. B.V., "Higher Engineering Mathematics", McGraw Hill Education Pvt. Ltd, New Delhi, 2016

CO's - PO's MAPPING:

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

1- Low, 2- Medium, 3-High, "-" No Correlation

SVHEC-R2023

16/07/2023
H82/2023


Chairman
BoS/S&H

23PHT11

ENGINEERING PHYSICS
(Common to B.E./B. Tech. all branches)

L T P C
3 0 0 3

COURSE OBJECTIVES:

- To make the students effectively achieve an understanding of mechanics
- Provide knowledge of elastic property, thermal property of materials and its applications
- Impart knowledge of laser and their applications
- Introduce the essential principles of fiber optics and its applications
- Equipping the students to successfully understand the importance of quantum physics

UNIT-I

MECHANICS

10

Multi-particle dynamics: Center of mass (CM) – CM of continuous bodies – motion of the CM – kinetic energy of the system of particles. Rotation of rigid bodies: Rotational kinematics – rotational kinetic energy and moment of inertia – theorems of M – M.I of a diatomic molecule – torque – rotational dynamics of rigid bodies – rotational energy state of a rigid diatomic molecule – torsional pendulum – double pendulum

UNIT-II

PROPERTIES OF MATTER AND THERMAL PHYSICS

10

Elasticity- Hooke's law – stress – strain diagram – Poisson's ratio – Factors affecting elasticity – bending of beams-Bending moment equation – Depression of a cantilever-Young's modulus by uniform bending – I-shaped girders-Modes of heat transfer – thermal conductivity – Newton's law of cooling – Linear heat law – Lee's disc method – conduction through compound media (series and parallel)

UNIT-III

LASER

9

Lasers: Stimulated absorption – Spontaneous emission – Stimulated emission – Population inversion-Einstein's coefficients derivation and their relations – Pumping methods – Types of lasers – Nd:YAG, CO₂ laser, Semiconductor lasers (homojunction & heterojunction) – Industrial and Medical Applications of lasers

UNIT-IV

FIBER OPTICS

8

Principle and propagation of light in optical fibres – Numerical aperture and Acceptance angle – Types of optical fibres (material, refractive index, mode) – attenuation, dispersion, bending – Fiber optics communication system (qualitative) – Temperature and displacement sensors – fiber optic endoscope

UNIT-V

QUANTUM PHYSICS

8

Photons and light waves – Electrons and matter waves – Compton effect: theory of scattering – Derivation and experimental verification – The Schrodinger equation (Time dependent and

time independent forms) – particle in a one-dimensional rigid box for eigen value and eigen function – tunneling (qualitative) – scanning tunneling microscope

TOTAL: 45 PERIODS

COURSE OUTCOME:

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

- CO1: Understand the importance of mechanics.
- CO2: Describe the Elastic property of solid materials and thermal conductivity of solids in industrial applications
- CO3: Demonstrate a foundational knowledge in lasers
- CO4: The students will get knowledge on fiber optics
- CO5: Understand the importance of quantum physics

TEXT BOOKS:

1. D.Kleppner and R.Kolenkow, "An Introduction to Mechanics," McGraw Hill Education (Indian Edition), 2017
2. Arthur Beiser, Shobhit Mahajan, S.Rai Choudhury, "Concepts of Modern Physics," McGraw-Hill (Indian Edition), 2017

REFERENCE BOOKS:

1. K.Thyagarajan and A.Ghatak, "Lasers: Fundamentals and Applications," Laxmi Publications, (Indian Edition), 2023
2. D.Halliday, R.Resnick and J.Walker, "Principles of Physics," Wiley (Indian Edition), 2021
3. N.Garcia, A.Damask and S.Schwarz, "Physics for Computer Science Students," Springer-Verlag, 2012

CO's- PO's MAPPING

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

1- Low, 2- Medium, 3-High, "-" No Correlation

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23CYT11

ENGINEERING CHEMISTRY
(Common to B.E./B. Tech. all branches)

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To inculcate sound understanding of water quality parameters and water treatment techniques
- To impart knowledge on the basic principles and preparatory methods of nanomaterials
- To introduce the basic concepts and applications of phase rule and composites
- To facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics
- To familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices

UNIT-I

WATER AND ITS TREATMENT

9

Water: Sources and impurities, **Water quality parameters:** turbidity, pH, hardness, alkalinity, TDS, COD and BOD. **Desalination of brackish water:** Reverse Osmosis. **Boiler troubles:** Scale and sludge, Boiler corrosion, Caustic embrittlement, Priming & foaming. **Treatment of boiler feed water:** Internal treatment (phosphate, colloidal, sodium aluminate and calgon conditioning) and External treatment - Ion exchange demineralisation and zeolite process. **Municipal water treatment:** primary treatment and disinfection (UV, Ozonation, break-point chlorination)

UNIT-II

NANOCHEMISTRY

9

Basics: Distinction between molecules, nanomaterials and bulk materials; **Size-dependent properties** (optical, electrical, mechanical and magnetic); **Types of nanomaterials:** De inition, properties and uses of - nanoparticle, nanowire and nanotube. **Preparation of nanomaterials:** sol-gel, solvothermal, laser ablation, electrochemical deposition. **Applications** of nanomaterials with examples in medicine, agriculture, energy, electronics and catalysis.

UNIT-III


PHASE RULE AND COMPOSITES

9

Phase rule: Introduction, de inition of terms with examples. One component system - water system; Reduced phase rule; Construction of a simple eutectic phase diagram - Thermal analysis; Two component system: lead-silver system - Pattinson's process.

Composites: Introduction: De inition & Need for composites; **Constitution:** Matrix materials (Polymer matrix, metal matrix and ceramic matrix) and Reinforcement (fiber, particulates, lakes and whiskers). **Properties and applications of:** Metal matrix composites (MMC), Ceramic matrix composites and Polymer matrix composites.

SVHEC-R2023


Chairman
BoS / S&H

UNIT-IV

FUELS AND COMBUSTION

9

Fuels: Introduction: Classification of fuels; **Coal and coke:** Analysis of coal (proximate and ultimate), Carbonization, Manufacture of metallurgical coke (Otto Hoffmann method). **Petroleum and Diesel:** Manufacture of synthetic petrol (Bergius process), Knocking - octane number, diesel oil - cetane number; **Solid biofuels, Compressed biogas, Power alcohol and biodiesel.**

Combustion of fuels: Introduction: Calorific value - higher and lower calorific values, Theoretical calculation of calorific value; **Flue gas analysis - ORSAT Method.** **CO₂ emission and carbon foot print.**

UNIT-V

ENERGY SOURCES AND STORAGE DEVICES

9

Nuclear energy: light water nuclear power plant, breeder reactor. **Solar energy conversion:** Principle, working and applications of solar cells; **Recent developments in solar cell materials.** **Wind energy; Geothermal energy; Batteries:** Types of batteries, Primary battery - dry cell, Secondary battery - lead acid battery and lithium-ion-battery; **Electric vehicles-working principles; Fuel cells:** H₂-O₂ fuel cell, microbial fuel cell; **Supercapacitors:** Storage principle, types and examples

TOTAL : 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able

- C01:** To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.
- C02:** To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
- C03:** To apply the knowledge of phase rule and composites for material selection requirements.
- C04:** To recommend suitable fuels for engineering processes and applications.
- C05:** To recognize different forms of energy resources and apply them for suitable applications in energy sectors

TEXT BOOKS:

1. P. C. Jain and Monica Jain, "Engineering Chemistry", 17th Edition, Dhanpat Rai Publishing Company (P) Ltd, New Delhi, 2018
2. S.S. Dara, "A text book of Engineering Chemistry", S. Chand Publishing, 12th Edition, 2018

SVHEC- R2023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

REFERENCE BOOKS:

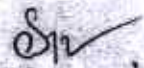
1. Shashi Chawla, "A Text Book of Engineering Chemistry", Dhanpar Rai & Co (Pvt.) Ltd, New Delhi, 2011
2. O.G. Palanna, "Engineering Chemistry", McGraw Hill Education (India) Private Limited, 2nd Edition, 2017
3. Dr. A.Ravikrishnan, "Engineering Chemistry", Sri Krishna Hitech Publishing Company Pvt. Limited, 23rd Edition, 2023

CO's- PO's MAPPING:

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

1- Low, 2- Medium, 3-High, "-" No Correlation

SVHEC- R2023


Chairman
BoS/S&H

23CST11**PROBLEM SOLVING AND PYTHON PROGRAMMING****L T P C**

(Common to: B.E. / B.Tech. all Branches)

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

23TAT11

தமிழர் மரபு

L T P C
1 0 0 1

(B.E./B.Tech- அனைத்து பாடப்பிரிவுகளுக்கும் பொதுவானது)

பாடநெறி நோக்கங்கள்:

- > தமிழின் இலக்கியங்கள் மற்றும் நவீன இலக்கியங்களைப் புரிந்துகொள்ளுதல்
- > தமிழ் கலாச்சார பாரம்பரியத்தைக் கற்றுக்கொள்ளுதல்
- > தமிழர்களின் பல்வேறு கலைவடிவங்களைக் கண்டறிதல்
- > தமிழர்களின் திணைக்கோட்பாடுகளை விளக்குதல்
- > இந்திய சுதந்திர போராட்ட இயக்கங்களுக்கும் இந்திய கலாச்சாரத்திற்குமான தமிழர்களின் பங்களிப்பை உணர்தல்

அலகு - I

மொழி மற்றும் இலக்கியம்

3

இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி - தமிழ் செவ்விலக்கியங்கள் - சங்க இலக்கியத்தின் சமய சார்பற்ற தன்மை - சங்க இலக்கியத்தில் பகிர்தல் ஆறம் - திருக்குறளில் மேலாண்மைக் கருத்துக்கள் - தமிழ்க் காப்பியங்கள், தமிழகத்தில் சமணப் பெளத்த மதங்களின் தாக்கம் - பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள் - தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

அலகு - II

மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை - சிற்பக் கலை

3

நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன் சிலைகள் - பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப்பொருட்கள், பொம்மைகள் - தேர் செய்யும் கலை - சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரிமுனையில் திருவள்ளுவர் சிலை - இசைக்கருவிகள் - மிருதங்கம், பறை வீணை, யாழ், நாதஸ்வரம் - தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.

அலகு - III

நாட்டப்புறக் கலைகள் மற்றும் வீரவிளையாட்டுகள்

3

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஓயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

அலகு - IV

தமிழர்களின் திணைக் கோட்பாடுகள்

3

தமிழகத்தின் தாவரங்களும், விலங்குகளும் - தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் - தமிழர்கள் போற்றிய அறக்கோட்பாடு - சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவு, கல்வியும் - சங்ககால நகரங்களும் துறைமுகங்களும் - சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - கடல்கடந்த நாடுகளில் சோழர்களின் வெற்றி

SVHEC-R2023

சுயநிர்வாகம்
2023-2024

Chairman
BoS / S&H

அலகு - V

இந்திய தேசிய இயக்கம் மற்றும்

3

இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு

இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு - இந்தியாவின் பிற்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் - சுயமரியாதை இயக்கம் - இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு - கல்வெட்டுகள், கையெழுத்துப்படிக்கள் - தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.

மொத்தம்: 15 பாடவேளைகள்

பாடநெறி முடிவுகள்:

இப்பாடத்தைப் படிப்பதின் முடிவில் மாணவர்கள்

- CO1: தமிழின் பல்வேறு இலக்கியங்களைப் பற்றிய அறிவைப் பெறுவார்கள்
- CO2: தமிழ் கலாச்சார பாரம்பரியத்தின் தனித்தன்மையைக் கற்றுக்கொள்வார்கள்
- CO3: தமிழகத்தின் பல்வேறு கலைவடிவங்களைக் கண்டறிவார்கள்
- CO4: தமிழர்களின் திணைக்கோட்பாடுகளை அறிந்துகொள்வார்கள்
- CO5: தமிழ் சுதந்திரப்போராட்ட வீரர்கள் மற்றும் தமிழ் கலாச்சாரத்தை இந்தியாவின் மற்ற பகுதியுடன் ஒப்பிடும் திறனைப் பெறுவார்கள்

மின் -ஆதாரங்கள்:

1. <https://www.tamilvu.org/>

CO's -PO's விவரணையாக்கம்:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	1	1	1	-	1	-	-
CO2	-	-	-	-	-	1	1	1	-	1	-	-
CO3	-	-	-	-	-	1	1	1	-	1	-	-
CO4	-	-	-	-	-	1	1	1	-	1	-	-
CO5	-	-	-	-	-	1	1	1	-	1	-	-
AVG	-	-	-	-	-	1	1	1	-	1	-	-

1- Low, 2- Medium, 3-High, "-" No Correlation

SVHEC-R2023

செயல்பாட்டு
மேலாட்சி

Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23TAT11

HERITAGE OF TAMILS
(Common to B.E./B. Tech. all branches)

L T P C
1 0 0 1

COURSE OBJECTIVES:

- To understand the Sangam and modern literature of Tamil
- To learn the heritage of Tamil culture
- To recognize the various art forms of Tamils
- To explain the Thinaï concept of Tamils
- To realize the contribution of Tamils to Indian national movement and Indian culture

UNIT-I **LANGUAGE AND LITERATURE** **3**
Language Families in India - Dravidian Languages - Tamil as a Classical Language - Classical Literature in Tamil - Secular Nature of Sangam Literature - Distributive Justice in Sangam Literature- Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land- Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.

UNIT-II **HERITAGE - ROCK ART PAINTINGS TO MODERN ART - SCULPTURE** **3**
Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.

UNIT-III **FOLK AND MARTIAL ARTS** **3**
Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

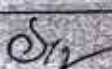
UNIT-IV **THINAI CONCEPTS OF TAMILS** **3**
Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

UNIT-V **CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE** **3**

Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India - Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine - Inscriptions & Manuscripts - Print History of Tamil Books.

TOTAL: 15 PERIODS

SVHEQ-R8023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

COURSE OUTCOMES:

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

- CO1:** Gain knowledge about various literatures of Tamil
- CO2:** Learn the uniqueness of Tamil cultural heritage
- CO3:** Find various art forms of Tamil Nadu
- CO4:** Understand the Thinal concepts in Tamil
- CO5:** Distinguish the contribution of Tamils to Indian national movement and Indian culture

E- RESOURCES:

1. <https://www.tamilvu.org/>

CO's-PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	1	1	1	-	1	-	-
CO2	-	-	-	-	-	1	1	1	-	1	-	-
CO3	-	-	-	-	-	1	1	1	-	1	-	-
CO4	-	-	-	-	-	1	1	1	-	1	-	-
CO5	-	-	-	-	-	1	1	1	-	1	-	-
AVG	-	-	-	-	-	1	1	1	-	1	-	-

1- Low, 2- Medium, 3-High, "-" No Correlation

SVHEC-R2023


Chairman
BoS / S&H

SVHEC-R2023
BoS / S&H

PROBLEM SOLVING AND PYTHON PROGRAMMING**L T P C****23CSL11****LABORATORY**

0 0 4 2

(Common to: B.E. / B.Tech. all Branches)

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

23PCL11

PHYSICS AND CHEMISTRY LABORATORY
(Common to B.E./B. Tech. all branches)

L	T	P	C
0	0	4	2

PHYSICS LABORATORY
(Any Seven Experiments)

COURSE OBJECTIVES:

- Determination of the physical parameters such as young's modulus by Uniform bending method, Non-Uniform bending method, Simple harmonic oscillations of cantilever and rigidity modulus of wire
- To impart knowledge in the determination of the thermal conductivity of a bad conductor by Lee's Disc method and band gap of a semiconductor
- Determination of the wavelength of the laser using grating, numerical aperture and acceptance angle in an optical fiber and width of the groove in a compact disc by using laser
- Determination of the velocity of sound and compressibility of liquids by using ultrasonic interferometer
- Knowledge on the frequency of alternating current using electrically vibrating tuning fork by using Melde's apparatus

LIST OF EXPERIMENTS

1. Determination of Young's modulus by Uniform bending method
2. Determination of Young's modulus by non-uniform bending method
3. Simple harmonic oscillations of cantilever
4. Determination of rigidity modulus of wire and moment of inertia of regular objects - Torsion pendulum
5. Determination of thermal conductivity of a bad conductor - Lee's Disc method
6. Determination of band gap of a semiconductor
7. Determination of the wavelength of the laser using grating
8. a) Determination of numerical aperture and acceptance angle in an optical fiber
b) Determination of width of the groove in a compact disc by using laser
9. Determination of the velocity of sound and compressibility of liquids by using ultrasonic interferometer
10. Determination of the frequency of alternating current using electrically vibrating tuning fork - Melde's apparatus

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

- CO1: Experiment and determine the physical characteristics of given solid materials using Young's modulus-Uniform bending method, non-uniform bending method, cantilever method and Torsion Pendulum.
- CO2: Experiment and determine the thermal conductivity of a bad conductor using Lee's Disc method and band gap energy of a given semiconducting material using Zener diode.
- CO3: Experiment and determine the optical property of light sources, acceptance angle of optical fiber and width of the groove in a compact disc using Laser.
- CO4: Experiment and determine the velocity of ultrasonic waves using ultrasonic interferometer.
- CO5: Experiment and determine the frequency of alternating current using electrically vibrating tuning fork by using Melde's apparatus

TEXT BOOKS:

1. Dr. P. Mani, Engineering Physics Practicals, Dhanam Publications (2022)

CO's - PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	-	-	-	-	-	-	-	-
CO2	3	3	1	1	-	-	-	-	-	-	-	-
CO3	3	3	1	1	-	-	-	-	-	-	-	-
CO4	3	3	1	1	-	-	-	-	-	-	-	-
CO5	3	3	1	1	-	-	-	-	-	-	-	-
AVG	3	3	1	1	-	-	-	-	-	-	-	-

CHEMISTRY LABORATORY
(Any Seven Experiments)

COURSE OBJECTIVES:

- To inculcate experimental skills to test basic understanding of water quality parameters, such as acidity, alkalinity.
- To acquire the knowledge in total hardness and dissolved oxygen and its impacts in industries through experiments
- To understand the impacts of chlorine in water sample through volumetric analysis.
- To induce the students to familiarize with electroanalytical techniques in the determination of impurities in aqueous solutions.
- To determine the amount of metal ions through spectroscopic techniques.

LIST OF EXPERIMENTS

1. Preparation of Na_2CO_3 as a primary standard and estimation of acidity of a water sample using the primary standard.
2. Determination of types and amount of alkalinity in a water sample
3. Determination of total, temporary & permanent hardness of water by EDTA method.
4. Determination of DO content of water sample by Winkler's method.
5. Determination of chloride content of water sample by Argentometric method.
6. Determination of strength of given hydrochloric acid using pH meter.
7. Determination of strength of acids in a mixture of acids using conductivity meter.
8. Conductometric titration of barium chloride against sodium sulphate (precipitation titration).
9. Estimation of iron content of the given solution using potentiometer.
10. Estimation of sodium /potassium present in water using a flame photometer.

TOTAL: 30 PERIODS

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

COURSE OUTCOMES:

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

- CO1:** Analyse the quality of water samples with respect to their acidity and alkalinity of water samples
- CO2:** Examine the water quality parameters like total hardness and DO with volumetric analysis.
- CO3:** Learn the permissible limit of chlorine in the given water sample
- CO4:** Analyse the impurities in solution by electro analytical techniques quantitatively
- CO5:** Determine the amount of metal ions through spectroscopic techniques.

CO's - PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	-	-	3	3	1	-	-	-	1
CO2	3	2	2	-	-	3	3	1	-	-	-	1
CO3	3	2	1	-	-	3	3	1	-	-	-	1
CO4	3	2	2	-	1	2	1	-	-	-	-	-
CO5	3	2	1	-	1	2	1	-	-	-	-	-
Avg.	3	2	1	-	1	3	2	1	-	-	-	1

TEXT BOOKS:

1. "Vogel's Textbook of Quantitative Chemical Analysis", (8th Edition, 2014)
2. J. Mendham, R. C. Denney, J.D. Barnes, M. Thomas and B. Sivasankar, "Vogel's Textbook of Quantitative Chemical Analysis", (2009)

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23ENL11

ENGLISH LABORATORY
(Common to B.E./B.Tech. all Branches)

L T P C
0 0 2 1

COURSE OBJECTIVES:

- To improve the communicative competence of learners.
- To help learners use language effectively in academic /work contexts.
- To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc.
- To build on students' English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.
- To use language efficiently in expressing their opinions via various media.

UNIT-I INTRODUCTION TO FUNDAMENTALS OF COMMUNICATION 6

Listening- Listening for General Information-Specific Details- Conversation: Introduction to Classmates - Audio / Video (Formal & Informal); Telephone Conversation; Listening to Voicemail & Messages; Listening and Filling a Form.

Speaking- Making Telephone Calls- Self Introduction; Introducing a Friend; - Politeness Strategies- Making Polite Requests, Making Polite Offers, Replying to Polite Requests and Offers- Understanding Basic Instructions (Filling out a Bank Application for Example).

UNIT-II NARRATION AND SUMMATION 6

Listening - Listening to Podcasts, Anecdotes / Stories / Event Narration; Documentaries and Interviews with Celebrities.

Speaking - Narrating Personal Experiences / Events-Talking about Current and Temporary Situations & Permanent and Regular Situations - Describing Experiences and Feelings- Engaging in Small Talk- Describing Requirements and Abilities.

UNIT-III DESCRIPTION OF A PROCESS / PRODUCT 6

Listening - Listen to Product and Process Descriptions; A Classroom Lecture; and Advertisements about Products.


Speaking - Picture Description- Describing Locations in Workplaces- Giving Instruction to Use the Product- Explaining Uses and Purposes- Presenting a Product- Describing Shapes and Sizes and Weights- Talking about Quantities (Large & Small)- Talking about Precautions.

UNIT-IV CLASSIFICATION AND RECOMMENDATIONS 6

Listening - Listening to Technology, Entertainment and Design (TED) Talks; Listening to Lectures - and Educational Videos.

Speaking - Small Talk; Discussing and Making Plans-Talking about Tasks-Talking about Progress-Talking about Positions and Directions of Movement- Talking about Travel Preparations- Talking about Transportation.

SVHEC-R2023


Chairman
BoS / S&H

UNIT-V

EXPRESSION

6

Listening - Listening to Debates/ Discussions; Different Viewpoints on an Issue; and Panel Discussions.

Speaking - Making Predictions- Talking about a Given Topic-Giving Opinions- Understanding a Website- Describing Processes.

TOTAL : 30 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able

- CO1:** To listen to and understand general and complex academic information
- CO2:** To listen to and understand different points of view in a discussion
- CO3:** To speak fluently and accurately in formal and informal communicative contexts
- CO4:** To describe products and processes and explain their uses clearly as well as accurately
- CO5:** To express their opinions effectively in both formal and informal discussions

E. RESOURCES:

- <https://www.ted.com/about/programs-initiatives/ted-talks-education>
- <https://learnenglish.britishcouncil.org/>

CO's & PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	3	3	-	3
CO2	-	-	-	-	-	-	-	-	3	3	-	3
CO3	-	-	-	-	-	-	-	1	2	3	-	2
CO4	-	-	-	-	-	-	-	-	2	3	-	2
CO5	-	-	-	-	-	-	-	1	3	3	-	2
AVR	-	-	-	-	-	-	-	1	3	3	-	2

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

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23ENT21

PROFESSIONAL ENGLISH - II
(Common to B.E./B.Tech. all Branches)

L T P C
2 0 0 2

COURSE OBJECTIVES:

- To engage learners in meaningful language activities to improve their reading and writing skills.
- To learn various reading strategies and apply in comprehending documents in professional context.
- To help learners understand the purpose, audience, contexts of different types of writing.
- To develop analytical thinking skills for problem solving in communicative contexts.
- To demonstrate an understanding of job applications and interviews for internship and placements.

UNIT-I

MAKING COMPARISONS

6

Reading - Reading Advertisements, User Manuals, Brochures Emails.

Writing - Professional Emails, Email Etiquette - Compare and Contrast Essay.

Grammar - Mixed Tenses, Prepositional Phrase.

UNIT-II

EXPRESSING CAUSAL RELATIONS IN SPEAKING AND WRITING

6

Reading - Reading Longer Technical Texts- Cause and Effect Essays, and Letters / Emails of Complaint.

Writing - Writing Responses to Complaints.

Grammar - Active Passive Voice Transformations, In initive and Gerunds.

UNIT-III

PROBLEM SOLVING

6

Reading - Case Studies, Excerpts from Literary Texts, News Reports etc.

Writing - Letter to the Editor, Checklists, Problem Solution Essay / Argumentative Essay.

Grammar - Error Correction; If Conditional Sentences.

UNIT-IV

CLASSIFICATION AND RECOMMENDATIONS

6

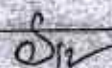
Reading - Newspaper Articles.

Writing - Recommendations, Transcoding, Accident Report, Survey Report

Grammar - Reported Speech, Modals.

Vocabulary - Conjunctions- Use of Prepositions.

SVHEC -R2023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

UNIT-V

EXPRESSION

6

Reading - Company Profiles, Statement of Purpose, (SOP), An Excerpt of Interview with Professionals.

Writing - Job / Internship Application – Cover Letter & Resume.

Grammar - Numerical Adjectives, Relative Clauses.

TOTAL : 30 PERIODS

COURSE OUTCOMES:

At the end of the Course the students will able to

- CO1:** Compare and contrast products and ideas in technical texts.
- CO2:** Identify and report cause and effects in events, industrial processes through technical texts
- CO3:** Analyse problems in order to arrive at feasible solutions and communicate them in the written format
- CO4:** Present their ideas and opinions in a planned and logical manner
- CO5:** Draft effective resumes in the context of job search.

TEXT BOOKS:

1. Department of English, Anna University, "English for Engineers & Technologists" Orient Blackswan Private Ltd, 2020.
2. Dr.Veena Selvam, Dr.Sujatha Priyadarshini, & CO, Department of English, Anna University, "English for Science & Technology" Cambridge University Press, 2021.


REFERENCE BOOKS:

1. Raman, Meenakshi, Sharma & Sangeeta, "Professional English", Oxford University Press, New Delhi, 2019.
2. Dr. V. Chellammal, "Learning to Communicate", Allied Publishers, New Delhi, 2003
3. V.N. Arora and Laxmi Chandra, "Improve Your Writing", Oxford University Press, New Delhi, 2001.

E. RESOURCES:

- <https://learnenglish.britishcouncil.org/>

SVHEC -R2023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

CO'S-PO'S MAPPING :

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	-	1	-	-	-	-	-	1	2	3	-	2
C02	-	-	-	-	-	-	1	-	3	3	-	3
C03	-	1	1	-	-	-	-	-	3	3	-	3
C04	-	-	-	-	-	-	-	-	2	3	-	2
C05	-	-	-	-	-	-	-	-	2	3	-	2
AVG	-	1	1	-	-	-	1	1	2	3	-	2

1. Low, 2- Medium, 3-High, "-" No Correlation

Shree Venkateshwara HI-Tech Engineering College (Autonomous)

23MAT21

NUMERICAL METHODS AND STATISTICS
(Common to B.E./B.Tech. all Branches)

L T P C
3 1 0 4

COURSE OBJECTIVES:

- To introduce the basic concepts of solving algebraic and transcendental equations
- To introduce the numerical techniques of interpolation in various intervals and differentiation and integration in engineering and technology
- To acquaint the knowledge of various techniques and methods of solving ordinary differential equations
- To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems
- To introduce the basic concepts of classifications of design of experiments which plays very important roles in the field of engineering and statistical quality control

UNIT-I SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS 9+3

Solution of algebraic and transcendental equations - Fixed point iteration method - Newton Raphson method- Solution of linear system of equations - Gauss elimination method - Pivoting-Gauss Jordan method - Iterative methods of Gauss Jacobi and Gauss Seidel - Eigen values of a matrix by Power method and Jacobi's method for symmetric matrices.

UNIT-II INTERPOLATION, NUMERICAL DIFFERENTIATION AND 9+3
NUMERICAL INTEGRATION

Lagrange's and Newton's divided difference interpolations - Newton's forward and backward difference interpolation - Approximation of derivatives using interpolation polynomials - Numerical single and double integrations using Trapezoidal and Simpson's 1/3 rules

UNIT-III NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL 9+3
EQUATIONS

Single step methods: Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first order differential equations - Multi step methods: Milne's and Adams - Bash forth predictor corrector methods for solving first order differential equations.

UNIT-IV TESTING OF HYPOTHESIS 9+3

Sampling distributions - Tests for single mean, proportion and difference of means (Large and small samples) - Tests for single variance and equality of variances - Chi square test for goodness of fit - Independence of attributes

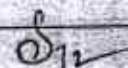
UNIT-V DESIGN OF EXPERIMENTS 9+3

One way and two way classifications - Completely randomized design - Randomized block design - Latin square design - 2^2 factorial design.

TOTAL : 60 PERIODS

SVHEC- R2023

SVHEC- R2023


Chairman
BoS / S&H

Shree Venkateshwara HI-Tech Engineering College (Autonomous)

COURSE OUTCOMES:

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

- CO1 :** Apply the numerical techniques of interpolation in various intervals and differentiation and integration for engineering problems
- CO2 :** Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations
- CO3 :** Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications
- CO4 :** Apply the concept of testing of hypothesis for small and large samples in real life problems
- CO5 :** Apply the basic concepts of classifications of design of experiments in the field of agriculture

TEXT BOOKS:

1. Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 9th Edition, 2023
2. Grewal, B.S., and Grewal, J.S., "Numerical Methods in Engineering and Science", Khanna Publishers, 10th Edition, New Delhi, 2019

REFERENCE BOOKS:


1. Gupta S.C. and Kapoor V. K., "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, New Delhi, 12th Edition, 2020
2. Burden, R.L and Faires, J.D, "Numerical Analysis", 9th Edition, Cengage Learning, 2016
3. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage
4. Learning, New Delhi, 8th Edition, 2014
- 5 Walpole. R.E., Myers. R.H., Myers. S.L. and Ye. K., "Probability and Statistics for Engineers and Scientists", 9th Edition, Pearson Education, India, 2022

CO's - PO's MAPPING

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

1- Low, 2- Medium , 3-High, "-" No Correlation

SVHEC- R2023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23PHT21

**PHYSICS FOR INFORMATION SCIENCE
(for B.E. / B.TECH- CSE, IT and AIDS)**

L T P C

3 0 0 3

COURSE OBJECTIVES:

- To make the students understand the importance in studying electrical properties of materials
- To enable the students to gain knowledge in semiconductor physics
- To instill knowledge on magnetic properties of materials
- To establish a sound grasp of knowledge on different optical properties of materials, optical displays and applications
- To inculcate an idea of significance of nano structures, quantum confinement, ensuing nano device applications and quantum computing.

UNIT-I

ELECTRICAL PROPERTIES OF MATERIALS

9

Classical free electron theory - Expression for electrical conductivity - Thermal conductivity, expression - Wiedemann-Franz law - Success and failures - electrons in metals - Fermi-Dirac statistics - Density of energy states - Electron in periodic potential - Energy bands in solids.

UNIT-II

SEMICONDUCTOR PHYSICS

9

Intrinsic Semiconductors - Energy band diagram - direct and indirect band gap semiconductors - Carrier concentration in intrinsic semiconductors - extrinsic semiconductors - Carrier concentration in N-type & P-type semiconductors - variation of Fermi level with temperature and impurity concentration - Hall effect and devices - Ohmic contacts - Schottky diode.

UNIT-III

MAGNETIC PROPERTIES OF MATERIALS

9

Magnetic dipole moment - atomic magnetic moments - magnetic permeability and susceptibility - Magnetic material classification: diamagnetism - paramagnetism - ferromagnetism - antiferromagnetism - ferrimagnetism - Domain Theory of ferromagnetism - Hard and soft magnetic materials - examples and uses - Magnetic principle in computer data storage - Magnetic hard disc (Giant Magneto Resistive sensor).

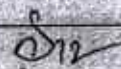
UNIT-IV

OPTICAL PROPERTIES OF MATERIALS

9

Classification of optical materials - carrier generation and recombination processes - Absorption emission and scattering of light in metals, insulators and semiconductors (concepts only) - photo current in a P-N diode - solar cell - LED - Organic LED - Laser diodes - Optical data storage techniques.

SVHEC -R2023


**Chairman
BoS / S&H**

UNIT-V

NANODEVICES AND QUANTUM COMPUTING

9

Introduction - quantum confinement - quantum structures: quantum wells, wires and dots - band gap of nanomaterials. Single electron transistor - Quantum system for information processing - quantum states - classical bits - quantum bits - CNOT gate - quantum gates - advantage of quantum computing over classical computing.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- CO1:** Gain knowledge on classical and quantum electron theories, and energy band structures
- CO2:** Acquire knowledge on basics of semiconductor physics and its applications in various devices
- CO3:** Get knowledge on magnetic properties of materials and their applications in data storage
- CO4:** Have the necessary understanding on the functioning of optical materials for optoelectronics
- CO5:** Understand the basics of quantum structures and their applications and basics of quantum computing

TEXT BOOKS:

1. S.O. Kasap, "Principles of Electronic Materials and Devices", McGraw-Hill Education (Indian Edition), 2020
2. Jasprit Singh, "Semiconductor Devices: Basic Principles", Wiley (Indian Edition), 2007
3. R.Murugesan, Kiruthiga Sivaprasath, "Modern Physics", S.Chand (Indian Edition), 2019

REFERENCE BOOKS:

1. Charles Kittel, "Introduction to Solid State Physics", Wiley India Edition, 2022
2. R.Balasubramaniam, Callister's, "Materials Science and Engineering", Wiley (Indian Edition), 2020
3. Parag K. Lala, "Quantum Computing: A Beginner's Introduction", McGraw-Hill Education (Indian Edition), 2020
4. B.Rogers, J.Adams and S.Pennathur, "Nanotechnology: Understanding Small Systems", CRC Press, 2015

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

CO's -PO's MAPPING:

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

1- Low, 2- Medium , 3-High, "-" No Correlation

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23EET22	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	L	T	P	C
	(For B.E./B.Tech- CIVIL, CSE, MECH, AI&DS, BME, IT, Pharm.Tech branches)	3	0	0	3

COURSE OBJECTIVES:

- To learn the basic concepts of electric circuits and analysis.
- To analyze the magnetic circuits and domestic wiring.
- To understand the basics of working principles and application of electrical machines.
- To impart knowledge about analog devices and their characteristics.
- To educate on the fundamental concepts of digital electronics.

UNIT-I	ELECTRIC CIRCUITS	10
---------------	--------------------------	-----------

Basic components of electric circuits, Charge, Current, Voltage and Power, Voltage and current sources, Ohm's law, Kirchhoff's laws, Series and parallel connected independent sources, Resistors in series and parallel, Voltage division and current division rule, Mesh current and node voltage methods of analysis-DC Circuits.

UNIT-II	MAGNETIC CIRCUITS AND ELECTRICAL INSTALLATIONS	10
----------------	---	-----------

Magnetic circuits-definitions-MMF, flux, reluctance, Magnetic field intensity, Flux density, Fringing, Self and Mutual inductances-simple problems. Domestic wiring, Wires and Cables - types, Earthing, Protective devices, Switch fuse unit, Safety precautions and First Aid.

UNIT-III	ELECTRICAL MACHINES	10
-----------------	----------------------------	-----------

Construction and working principle- DC generators, EMF equation, Types and applications. Working principle of DC motors, Types and applications. Construction, Working principle and applications of 1 ϕ Transformer, Three phase alternator, Three phase induction motor and Synchronous motor.

UNIT-IV	ANALOG ELECTRONICS	8
----------------	---------------------------	----------

Resistor, Inductor and Capacitor in electronic circuits, PN Junction diodes, Rectifier, Zener diode-Characteristics-Applications, Construction and characteristics of bipolar junction transistor-Biasing, JFET, MOSFET, IGBT, SCR, Amplifier -Applications.

UNIT-V	DIGITAL ELECTRONICS	7
---------------	----------------------------	----------

Review of number systems, Binary codes, Error detection and correction codes, Combinational logic Circuits, Representation of logic functions-SOP and POS forms, K-map representations, Minimization using K maps - Simple Problems.

TOTAL: 45 PERIODS


Chairman
BoS/EEE

COURSE OUTCOME

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

- CO1 Explain circuit's behavior using circuit laws and analyze the mesh analysis and nodal analysis.
- CO2 Analyze the Magnetic circuits, earthing and wiring.
- CO3 Understand the working principle and applications of electrical machines.
- CO4 Aanalyze the characteristics of analog electronic devices.
- CO5 Explain the basic concepts of digital electronics.

TEXT BOOKS:

1. D P Kothari and IJ Nagarath, "Basic Electrical and Electronics Engineering", McGraw Hill Education (India) Private Limited, Second Edition, 2020.
2. S.K. Bhattacharya, Basic Electrical Engineering, Pearson Education, 2019.
3. James A Svoboda, Richard C. Dorf, Dorf's Introduction to Electric Circuits, Wiley, 2018.
4. A.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2015.

REFERENCE BOOKS:

1. Muhammad H.Rashid, "Spice for Circuits and electronics", 4th Edition., Cengage India, 2019.
2. Thomas L. Floyd, 'Electronic Devices', 10th Edition, Pearson Education, 2018.
3. John Bird, "Electrical Circuit theory and technology", Routledge; 2017.
4. Albert Malvino, David Bates, 'Electronic Principles, McGraw Hill Education; 7th edition, 2017.
5. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw-Hill, New Delhi, 2010.

E-RESOURCES:

1. NPTEL-Online Courses and Video lectures: <https://nptel.ac.in/>

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	2	1	1	-	-	-	-	-	1	-	-	3	2	1
CO2	3	3	2	2	-	-	-	-	-	1	-	-	3	3	2
CO3	3	3	3	3	-	-	-	-	-	1	-	-	3	3	3
CO4	3	3	3	3	-	-	-	-	-	1	-	-	3	3	3
CO5	3	3	3	2	-	-	-	-	-	1	-	-	3	3	3
AVG	3	3	2	2	-	-	-	-	-	1	-	-	3	3	2

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

23MET21	ENGINEERING GRAPHICS (Common to: B.E./B.Tech. all Branches)	L T P C 2 0 4 4
----------------	---	----------------------------------

Course Objectives:

The main learning objective of this course is to prepare the students for:

- Drawing engineering curves.
- Drawing projection of points, lines and plane surface.
- Drawing projection of solids and freehand sketching.
- Drawing of sectioned solids and development of surfaces
- Drawing isometric and perspective projections of simple solids.

CONCEPTS AND CONVENTIONS (Not for Examination)

Importance of graphics in engineering applications - Use of drafting instruments - BIS conventions and specifications — Size, layout and folding of drawing sheets — Lettering and dimensioning.

UNIT-I PLANE CURVES 5+12

Basic Geometrical constructions, Curves used in engineering practices: Conics — Construction of ellipse, parabola and hyperbola by eccentricity method — Construction of cycloid — construction of involutes of square and circle — Drawing of tangents and normal to the above curves.

UNIT-II PROJECTION OF POINTS, LINES AND PLANE SURFACE 6+12

Principal Planes-First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT-III PROJECTION OF SOLIDS AND FREEHAND SKETCHING 6+12

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes and parallel to the other by rotating object method. Orthographic projection- Freehand sketching of multiple views from pictorial views of objects.

UNIT-IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES 7+12

Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other — obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids — Prisms, pyramids cylinders and cones.

UNIT-V ISOMETRIC AND PERSPECTIVE PROJECTIONS 6+12

Principles of isometric projection — isometric scale - Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions - Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method.

TOTAL : 90 PERIODS

COURSE OUTCOMES:

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

- CO1:** Construct the conic curves, involutes and cycloid
- CO2:** Solve practical problems involving projection of lines, Planes.
- CO3:** Draw Projection of solids and can draw freehand sketch.
- CO4:** Draw projection of sectioned solids and development of surfaces
- CO5:** Draw the isometric and perspective projections.

TEXT BOOKS:

1. K Venugopal, Engineering Drawing and Graphics, Sixth edition, New Age International, 2013.
2. Natrajan K.V., "A Text Book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018.

REFERENCE BOOKS:

1. Basant Agarwal and Agarwal C.M., "Engineering Drawing", McGraw Hill, 2nd Edition, 2019.
2. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Publications, Bangalore, 27th Edition, 2017.
3. Luzzader, Warren.J. and Duff, John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
4. Parthasarathy N. S. and Vela Murali, "Engineering Graphics", Oxford University, Press, New Delhi, 2015.
5. Shah M.B., and Rana B.C., "Engineering Drawing", Pearson Education India, 2nd Edition, 2009.

E-RESOURCES:

1. <https://archive.nptel.ac.in/courses/112/102/112102304/>
2. https://onlinecourses.nptel.ac.in/noc20_me79/preview
3. <https://www.youtube.com/watch?v=ANEvQyt3PnU>

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	1	2	-	2	-	-	-	-	3	-	2	2	2	-
CO2	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
CO3	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
CO4	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
CO5	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
Avg	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-

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

23CST21**PROGRAMMING IN C**

(for B.E. / B.Tech. - CSE, IT, AIDS, CS, AIML)

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

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

23TAT21

தமிழரும் தொழில்நுட்பமும்

L T P C
1 0 0 1

(B.E./B.Tech- அனைத்து பாடப்பிரிவுகளுக்கும் பொதுவானது)

பாடநெறி நோக்கங்கள்:

- > நெசவு மற்றும் பாணைத்தொழில்நுட்பத்தைப் புரிந்து கொள்ளுதல்
- > சேர, சோழ, பல்லவ மற்றும் நாயக்கர்களின் வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பத்தை ஒப்பிடுதல்
- > தமிழர்களின் பல்வேறு உற்பத்தி தொழில்நுட்பத்தைப் பற்றிய அறிவைப் பெறுதல்
- > தமிழர்களின் வேளாண்மை மற்றும் கடல்சார் அறிவைப் பெற்றுக்கொள்ளுதல்
- > அறிவியல் தமிழையும் அதன் இணையப்பயன்பாட்டையும் கற்றல்

அலகு - I

நெசவு மற்றும் கட்டிடத் தொழில்நுட்பம்

3

சங்க காலத்தில் நெசவுத்தொழில் - பாணைத் தொழில்நுட்பம் - கருப்பு சிவப்பு பாண்டங்கள் - பாண்டங்களில் கீறல் குறியீடுகள்சங்க காலத்தில் நெசவுத்தொழில் - பாணைத் தொழில்நுட்பம் - கருப்பு சிவப்பு பாண்டங்கள் - பாண்டங்களில் கீறல் குறியீடுகள்

அலகு - II

வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்

3

சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு - சங்க காலத்தில் கட்டுமானப்பொருட்களும் நடுகல்லும் - சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் - மாமல்லபுரச் சிற்பங்களும் கோவில்களும் - சோழர் காலத்து பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் - நாயக்கர் காலக் கோயில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் - செட்டிநாட்டு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ - சாரோசெனிக் கட்டிடக் கலை

அலகு - III

உற்பத்தித் தொழில்நுட்பம்

3

கப்பல் காட்டும் கலை - உலோகவியல் - இரும்புத் தொழிற்சாலை - இரும்பை உருக்குதல், எஃகு - வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் - மணி உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - சுடுமண் மணிகள் - சங்கு மணிகள் - எலும்புத்துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள்

SVHEC-R2023

SVHEC
R2023

Chairman
BoS / S&H

அலகு - IV வேளாண்மை மற்றும் நீர்பாசனத் தொழில்நுட்பம் 3

அணை, ஏரி, குளங்கள், மதகு - சோழர்காலக் குழுதித் தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப்பு - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன்வளம் - முத்து மற்றும் முத்துக்குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவுசார் சமூகம்

அலகு - V அறிவியல் தமிழ் மற்றும் கணினித்தமிழ் 3

அறிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின்பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக்கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் அகராதிகள் - சொற்குவைத் திட்டம்

மொத்தம்: 15 பாடவேளைகள்

பாடநெறி முடிவுகள்:

இப்பாடத்தைப் படிப்பதின் முடிவில் மாணவர்கள்

- CO1: நெசவு மற்றும் பாணத்தொழில்நுட்பத்தை பற்றிப் புரிந்துகொள்வார்கள்
CO2: வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பத்தில் தமிழர்களின் அறிவைப் பெறுவார்கள்
CO3: தமிழர்களின் உற்பத்தி தொழில்நுட்பத்தை கண்டறிவார்கள்
CO4: தமிழர்களின் வேளாண்மை மற்றும் கடல்சார் அறிவைக் குறித்து விவாதிப்பார்கள்.
CO5: பல்வேறு இணையப் பயன்பாடுகளில் அறிவியல் தமிழைப் பயன்படுத்திப்பார்ப்பார்கள்

மின் -ஆதாரங்கள்:

1. <https://www.tamilvu.org/>
2. <https://sorkuval.com/>

CO's-PO's விவரணையாக்கம்:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	1	1	1	1	1	-	1
CO2	2	-	-	-	-	2	2	2	2	2	-	2
CO3	2	-	-	-	-	2	2	2	2	2	-	2
CO4	1	-	-	-	-	1	1	1	1	1	-	1
CO5	2	-	-	-	-	2	2	2	2	2	-	2
AVG	2	-	-	-	-	2	2	2	2	2	-	2

SVHEC-R2023

SVHEC-R2023

Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23TAT21

TAMILS AND TECHNOLOGY
(Common to B.E./B. Tech. all branches)

L T P C
1 0 0 1

COURSE OBJECTIVES:

- To understand about weaving and ceramic technology of Tamils
- To compare the design and constructive technology of Cheras, Cholas, Pallavas and Nayakkars
- To gain knowledge in various manufacturing technology of Tamils
- To analyse the agriculture and fishery knowledge of Tamils
- To learn about scientific Tamil and its usage in online platforms

UNIT-I WEAVING AND CERAMIC TECHNOLOGY 3

Weaving Industry during Sangam Age - Ceramic technology - Black and Red Ware Potteries (BRW) - Graffiti on Potteries.

UNIT-II DESIGN AND CONSTRUCTION TECHNOLOGY 3

Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age - Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period.

UNIT-III MANUFACTURING TECHNOLOGY 3

Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting, steel -Copper and gold- Coins as source of history - Minting of Coins - Beads making-industries Stone beads - Glass beads - Terracotta beads -Shell beads/ bone beads - Archeological evidences - Gem stone types described in Silappathikaram.

UNIT-IV AGRICULTURE AND IRRIGATION TECHNOLOGY 3

Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries - Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society

UNIT-V SCIENTIFIC TAMIL & TAMIL COMPUTING 3

Development of Scientific Tamil - Tamil computing - Digitalization of Tamil Books - Development of Tamil Software - Tamil Virtual Academy - Tamil Digital Library - Online Tamil Dictionaries - Sorkuvai Project.

TOTAL: 15 PERIODS

SVHEC-R2023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

COURSE OUTCOMES:

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

- CO1:** Relate the weaving ceramic technology of Tamils
- CO2:** Understand the knowledge of Tamils in design and construction technology
- CO3:** Recognize the manufacturing technology knowledge of Tamils
- CO4:** Criticize the agriculture and fishery knowledge of Tamils
- CO5:** Apply scientific Tamil in Various online platforms

E- RESOURCES:


1. <https://www.tamilvu.org/>
2. <https://sorkuvai.com/>

CO's -PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	1	1	1	1	1	-	1
CO2	2	-	-	-	-	2	2	2	2	2	-	2
CO3	2	-	-	-	-	2	2	2	2	2	-	2
CO4	1	-	-	-	-	1	1	1	1	1	-	1
CO5	2	-	-	-	-	2	2	2	2	2	-	2
AVG	2	-	-	-	-	2	2	2	2	2	-	2

SYHEC-R2023

Chairman
BoS/S&H


Chairman
BoS/S&H

23MEL21

ENGINEERING PRACTICES LABORATORY
(Common to: B.E./B.Tech. all Branches)

L T P C
0 0 4 2

Course Objectives:

- Acquire skills in operating hand tools and instruments. Provide hands on training on common household plumbing work and wood work
- Provide hands on training on welding processes.
- Provide hands on training on various simple machining processes. Making a tray out of metal sheet using sheet metal work.
- Wiring various electrical joints in common household electrical wire network.
- Soldering and testing simple electronic circuits. Assembling and testing simple electronic components on PCB.

GROUP - A (CIVIL & MECHANICAL)

I) CIVIL ENGINEERING PRACTICES

(12)

PLUMBING WORK:

Hands-on-exercise:

Basic pipe connections - Mixed pipe material connection - Pipe connections with different joining components - External thread cutting

WOOD WORK:

Hands-on-exercise: Sawing, Planing and Making joints

II) MECHANICAL ENGINEERING PRACTICES

(18)

WELDING WORK:

Fabrication of Models with MS Plate using Arc Welding

BASIC MACHINING WORK:

- a) Simple Turning
- b) Drilling and Tapping Practice

SHEET METAL WORK:

Model making - Trays and funnels

ASSEMBLING AND DISMANTLING WORK:

Assembling a centrifugal pump

GROUP B (ELECTRICAL & ELECTRONICS)

III) ELECTRICAL ENGINEERING PRACTICES

(15)

- a) Introduction to switches, fuses, indicators and lamps - Basic switch board wiring with lamp, fan and three pin socket
- b) Staircase wiring
- c) Fluorescent Lamp wiring with introduction to CFL and LED types.
- d) Energy meter wiring and related calculations/ calibration
- e) Study of Iron Box wiring and assembly
- f) Study of Fan Regulator (Resistor type and Electronic type using Diac/Triac/quadrac)
- g) Study of emergency lamp wiring/Water heater

IV) ELECTRONIC ENGINEERING PRACTICES

(15)

SOLDERING WORK:

Soldering simple electronic circuits and checking continuity

ELECTRONIC ASSEMBLY AND TESTING WORK:

Assembling and testing electronic components on a small PCB

ELECTRONIC EQUIPMENT STUDY:

- Study elements of smart phone
- Assembly and dismantle of LED TV
- Assembly and dismantle of computer/ laptop

TOTAL : 60 PERIODS

COURSE OUTCOMES:

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

- CO1: Make a wooden model using carpentry Process.
- CO2: Make various shapes using welding processes.
- CO3: Make various shapes using manufacturing processes like machining and sheet metal work.
- CO4: Wires various electrical joints in common household electrical wire network.
- CO5: Solder and test simple electronic circuits. Assemble and test simple electronic components on PCB.

REFERENCE:

- Manual prepared by the faculty of Civil, Mechanical, Electrical and Electronics and Communication Engineering Department, SVHEC.

E-RESOURCES:

- <https://www.youtube.com/watch?v=GPnQjCrb83Y>
- <https://www.youtube.com/watch?v=njwdsMI3PcY>

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	-	-	-	-	-	-	-	-	2	1	1
CO2	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
CO3	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
CO4	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
CO5	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
Avg	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1

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

23CSL21

PROGRAMMING IN C LABORATORY
(for B.E. / B.Tech. - CSE, IT, AIDS, CS, AIML)

L	T	P	C
0	0	4	2

COURSE OBJECTIVES:

- 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

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.

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.

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

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23ENL21

COMMUNICATION LABORATORY
(Common to B.E./B.Tech. all Branches)

L T P C
0 0 4 2

COURSE OBJECTIVES:

- To identify varied group discussion skills and apply them to take part in effective discussions in a professional context.
- To analyse concepts and problems and make effective presentations explaining them clearly and precisely.
- To be able to communicate effectively through formal and informal writing.
- To be able to use appropriate language structures to write emails, reports and essays
- To give instructions and recommendations that are clear and relevant to the context

UNIT-I

MAKING COMPARISONS

12

Speaking - Role Play Exercises Based on Workplace Contexts- Talking about Competition- Discussing Progress toward Goals- Talking about Experiences- Talking about Events in Life-Discussing Past Events.

Writing - Writing Emails (Formal & Semi-Formal)

UNIT-II

EXPRESSING CAUSAL RELATIONS IN SPEAKING AND WRITING

12

Speaking - Discussing News Stories - Talking about Frequency- Talking about Travel Problems-Discussing Travel Procedures- Talking about Travel Problems- Making Arrangements-Describing Arrangements- Arrangements Discussing Plans and Decisions-Discussing Purposes and Reasons- Understanding Common Technology Terms.

Writing -Writing Different Types of Emails.

UNIT-III

PROBLEM SOLVING

12

Speaking - Discussing Predictions- Describing the Climate- Discussing Forecasts and Scenarios- Talking about Purchasing- Discussing Advantages and Disadvantages- Making Comparisons- Discussing Likes and Dislikes- Discussing Feelings about Experiences- Discussing Imaginary Scenarios.

Writing - Short Essays and Reports- Formal/Semi-Formal letters.

UNIT-IV

CLASSIFICATION AND RECOMMENDATIONS


12

Speaking - Discussing the Natural Environment- Describing Systems- Describing Position and Movement Explaining Rules (Example- Discussing Rental Arrangements)- Understanding Technical Instructions.

Writing - Writing Instructions -Writing a Short Article.

SVHEC- R2023

SVHEC- R2023


Chairman
BOS / S&H

UNIT-V

EXPRESSION

12

Reading - Describing Things Relatively-Describing Clothing-Discussing Safety Issues (Making Recommendations) Talking about Electrical Devices-Describing Controlling Actions.

Writing - Job Application (Cover Letter + Curriculum Vitae) - Writing Recommendations.

TOTAL: 60 PERIODS

COURSE OUTCOMES:

At the end of the Course the students will able to

- CO1:** Speak effectively in group discussions held in a formal/semi formal contexts
- CO2:** Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions
- CO3:** Create emails, letters and effective job applications with resume.
- CO4:** Write critical reports to convey data and information with clarity and precision
- CO5:** Deliver suitable instructions and recommendations for safe execution of tasks

E-RESOURCES:

- <https://www.englishclub.com/speaking/>
- <https://learnenglish.britishcouncil.org/>

CO's-PO's MAPPING :

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

1- Low, 2- Medium, 3-High, "-" No Correlation

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23MDC21	YOGA FOR HUMAN EXCELLENCE (Common to B.E./B.Tech. all Branches)	<table border="0"><tr><td>L</td><td>T</td><td>P</td><td>C</td></tr><tr><td>0</td><td>0</td><td>1</td><td>0</td></tr></table>	L	T	P	C	0	0	1	0
L	T	P	C							
0	0	1	0							

UNIT-I	SIMPLIFIED PHYSICAL EXERCISES	3
---------------	--------------------------------------	----------

Physical exercises: Hand exercises – Leg exercises. Breathing exercises: Eye exercises – Kapalabathi. Makarasana. Body massages: Acupressure – Relaxation.

UNIT-II	KAYA KALPA	3
----------------	-------------------	----------

Kaya Kalpa Exercise – Aswini Mudra – Moola Bandha – Ojas Breath (Kayakalpa Exercise should be learnt directly from the World Community Service Centre.)

UNIT-III	MEDITATION	3
-----------------	-------------------	----------

Agna. Santhi : Clearence. Thuriya. Thuriyatheetam meditation

UNIT-IV	HUMAN RESOURCES DEVELOPMENT	3
----------------	------------------------------------	----------

Eradication of worries – Bene its of Blessings – Greatness of Friendship – Neutralization of anger - Individual peace and world peace

UNIT-V	YOGASANAS	3
---------------	------------------	----------

Suriya Namaskar, Padmasana, Vajrasana, Sukasana, Chakrasana (side posture), Viruchasana, Bhujangasana, Yoga mudra, Ustrasana, Maha Mudra, Vakkarasana.

TOTAL : 15 PERIODS

TEXT BOOKS:

1. Yoga Practices – I: VISION, Vethathiri Publications.
2. Yogasana – Vethathiri Publications

REFERENCE BOOKS:

1. Simplified Physical Exercises – Vethathiri Publications.
2. Sound health through yoga – Dr. K. Chandrasekaran.


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23MAT31

DISCRETE MATHEMATICS
(for B.E. / B.Tech - CSE, IT and AIDS)

L	T	P	C
3	1	0	4

COURSE OBJECTIVES:

- To extend student's logical and mathematical maturity and ability to deal with abstraction.
- To introduce most of the basic terminologies use in computer science courses and application of ideas to solve practical problems.
- To understand the basic concepts of combinatorics and graph theory.
- To familiarize the applications of algebraic structures.
- To understand the concepts and significance of lattices and Boolean algebra which are widely used in computer science and engineering.

UNIT-I

LOGIC AND PROOFS

9+3

Propositional logic –Propositional equivalences –Predicates and quantifiers – Nested quantifiers– Rules of inference - Introduction to proofs – Proof methods and strategy.

UNIT-II

COMBINATORICS

9+3

Mathematical induction – Strong induction and well ordering – The basics of counting – The pigeonhole principle – Permutations and combinations – Recurrence relations – Solving linear recurrence relations-Generating functions-Inclusion and exclusion principle and its applications.

UNIT-III

GRAPHS

9+3

Graphs and graph models–Graph terminology and special types of graphs–Matrix representation of graphs and graph isomorphism – Connectivity – Euler and Hamilton paths.

UNIT-IV

ALGEBRAIC STRUCTURES

9+3

Algebraic systems–Semi groups and monoids – Groups – Subgroups – Homomorphism's– Normal subgroup and cosets – Lagrange's theorem – Definitions and examples of Rings and Fields.

UNIT-V

LATTICES AND BOOLEAN ALGEBRA

9+3

Partial ordering- Posets - Lattices as posets – Properties of lattices – Lattices as algebraic systems – Sublattices – Direct product and homomorphism – Some special lattices-Boolean algebra-Sub Boolean Algebra - Boolean Homomorphism.

TOTAL : 60 PERIODS


Chairman
BoS / S&H

SVHEC- R2023

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

COURSE OUTCOMES:

At the end of the course, students would:

- CO1:** Have knowledge of the concepts needed to test the logic of a program.
- CO2:** Have an understanding in identifying structures on many levels.
- CO3:** Be aware of a class of functions which transform a finite set in to another finite set which relates to input and output functions in computer science.
- CO4:** Be aware of the counting principles.
- CO5:** Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.

TEXT BOOKS:

1. Rosen.K.H., "DiscreteMathematicsanditsApplications", 7th Edition, TataMcw Hill Pub. Co. Ltd., New Delhi, Special Indian Edition, 2017.
2. Tremblay. J.P. and Manohar. R, "Discrete Mathematical Structures with Applications to Computer Science", Tata Mc Graw Hill Pub. Co. Ltd, New Delhi, 30th Reprint, 2011.

REFERENCE BOOKS:

1. Grimaldi.R.P."Discrete and Combinatorial Mathematics :An Applied Introduction , 5thEdition, Pearson Education Asia, Delhi, 2013.
2. Koshy.T."Discrete Mathematics with Applications", Elsevier Publications,2006.
3. Lipschutz. S. and Mark Lipson., "Discrete Mathematics", Schaum's Outlines, Tata McGraw Hill Pub. Co. Ltd., New Delhi, 3rd Edition, 2010.

E-RESOURCES:

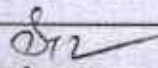
1. https://onlinecourses.nptel.ac.in/noc23_cs109/preview
2. https://onlinecourses.nptel.ac.in/noc23_cs22/preview
3. <https://nptel.ac.in/courses/106106183>

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	2	2	-	2	-	-	-	2	-	2	-	-	-
CO2	3	3	2	2	-	2	-	-	-	2	-	2	-	-	-
CO3	3	3	2	2	-	2	-	-	-	3	-	2	-	-	-
CO4	3	3	2	2	-	2	-	-	-	2	-	2	-	-	-
CO5	3	2	2	2	-	2	-	-	-	2	-	2	-	-	-
AVG	3	3	2	2	-	2	-	-	-	2	-	2	-	-	-

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

SVHEC- R2023


Chairman
BoS / S&H

23CST31

FOUNDATIONS OF DATA SCIENCE
 (for B.E./B.Tech – CSE, IT, and AIDS)

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To understand the data science fundamentals and process.
- To learn to describe the data for the data science process.
- To learn to describe the relationship between data.
- To utilize the Python libraries for Data Wrangling.
- To present and interpret data using visualization libraries in Python

UNIT-I**INTRODUCTION****9**

Data Science: Benefits and uses – facets of data - Data Science Process : Overview – Defining research goals – Retrieving data – Data preparation - Exploratory Data analysis – build the model-presenting findings and building applications -Data Mining -Data Warehousing-Basic Statistical descriptions of Data.

UNIT-II**DESCRIBING DATA****9**

Types of Data - Types of Variables -Describing Data with Tables and Graphs – Describing Data with Averages - Describing Variability - Normal Distributions and Standard (z) Scores.

UNIT-III**DESCRIBING RELATIONSHIPS****9**

Correlation -Scatter plots – correlation coefficient for quantitative data – computational formula for correlation coefficient – Regression – regression line – least squares regression line – Standard error of estimate – interpretation of r^2 – multiple regression equations – regression towards the mean.

UNIT-IV**PYTHON LIBRARIES FOR DATA WRANGLING****9**

Basics of Numpy arrays – aggregations – computations on arrays – comparisons, masks, boolean logic – fancy indexing – structured arrays – Data manipulation with Pandas – data indexing and selection – operating on data – missing data – Hierarchical indexing – combining datasets – aggregation and grouping – pivot tables.

UNIT-V**DATA VISUALIZATION****9**

Importing Matplotlib – Line plots – Scatter plots – visualizing errors – density and contour plots – Histograms – legends – colors – subplots – text and annotation – customization – three dimensional plotting - Geographic Data with Base map - Visualization with Seaborn.

TOTAL : 45 PERIODS

COURSE OUTCOMES:

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

- CO1 :** Define the data science process
- CO2 :** Understand different types of data description for data science process
- CO3 :** Gain knowledge on relationships between data
- CO4 :** Use the Python Libraries for Data Wrangling
- CO5 :** Apply visualization Libraries in Python to interpret and explore data

TEXT BOOKS:

1. David Cielen, Arno D. B. Meysman, and Mohamed Ali, "Introducing Data Science", Manning Publications, 2016. (Unit I)
2. Robert S. Witte and John S. Witte, "Statistics", Eleventh Edition, Wiley Publications, 2017. (Units II and III)
3. Jake VanderPlas, "Python Data Science Handbook", O'Reilly, 2016. (Units IV and V)

REFERENCE BOOKS:

1. Allen B. Downey, "Think Stats: Exploratory Data Analysis in Python", Green Tea Press, 2014.

E-RESOURCES:

1. <https://nptel.ac.in/courses/106106179>
2. <https://nptel.ac.in/courses/106106212>

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	1	2	2	-	-	-	1	1	1	2	2	2	2
CO2	2	1	-	1	1	-	-	-	2	1	1	2	2	3	1
CO3	2	2	1	2	2	1	1	-	1	2	1	3	2	2	3
CO4	1	2	2	1	2	-	-	-	1	1	2	2	3	3	2
CO5	2	2	1	2	2	-	-	-	1	1	1	2	2	2	2
AVG	2	2	1	2	2	1	1	-	1	1	1	2	2	2	2

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

23ITT31

DATA STRUCTURES AND ALGORITHMS

(for B.Tech. – IT, AIDS)

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To understand the concepts of ADTs
- To design linear data structures –lists, stacks, and queues
- To understand sorting, searching, and hashing algorithms
- To apply Tree structures using searching.
- To apply Graph structures to solve problems.

UNIT I**ABSTRACT DATA TYPES****9**

Abstract Data Types(ADTs)-ADTs and classes-introduction to OOP-classes in Python- inheritance - namespaces - shallow and deep copying Introduction to analysis of algorithms -asymptotic notations- divide & conquer-recursion- analyzing recursive algorithms.

UNIT II**LINEAR STRUCTURES****9**

List ADT-array-based implementations-linked list implementations-singly linked lists-circularly linked lists - doubly linked lists - Stack ADT - Queue ADT - double ended queues - applications

UNIT III**SORTING AND SEARCHING****9**

Bubble sort - selection sort - insertion sort - merge sort - quick sort - analysis of sorting algorithms-linear search-binary search-hashing-hash functions-collision handling-load factors, rehashing, and efficiency

UNIT IV**TREE STRUCTURES****9**

Tree ADT-Binary Tree ADT-tree traversals- binary search trees-AVL trees-heaps-multi- way search trees

UNIT V**GRAPH STRUCTURES****9**

Graph ADT - representations of graph - graph traversals - DAG - topological ordering - greedy algorithms - dynamic programming - shortest paths - minimum spanning trees - introduction to complexity classes and intractability

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- CO1:** Explain abstract data types
- CO2:** Design, implement, and analyze linear data structures, such as lists, queues, and stacks, according to the needs of different applications
- CO3:** Design, implement, and analyze efficient tree structures to meet requirements such as searching, indexing, and sorting.
- CO4:** Implement Tree structures to solve the searching problems.
- CO5:** Model problems as graph problems and implement efficient graph algorithms to solve them.

TEXT BOOKS:

1. Michael T.Goodrich, Roberto Tamassia, and Michael H.Goldwasser, "Data Structures & Algorithms in Python", An Indian Adaptation, John Wiley & Sons Inc., 2021

REFERENCE BOOKS:

1. Lee, KentD., Hubbard, Steve, "Data Structures and Algorithms with Python" Springer Edition 2015
2. Rance D.Necaise, "Data Structures and Algorithms Using Python", John Wiley & Sons, 2011
3. Aho, Hopcroft, and Ullman, "Data Structures and Algorithms", Pearson Education, 1983.
4. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, and Clifford Stein, "Introduction to Algorithms", Second Edition, McGraw Hill, 2002.
5. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Fourth Edition, Pearson Education, 2014

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	1	2	2	3	1	-	-	-	2	-	2	1	1	1	1
CO2	2	3	2	2	2	-	-	-	2	-	2	2	3	2	2
CO3	2	2	3	2	3	-	-	-	3	-	2	2	3	2	2
CO4	3	3	3	3	1	-	-	-	3	-	2	2	3	2	3
CO5	3	3	3	3	1	-	-	-	3	-	2	2	3	2	3
AVG	2.2	2.6	2.6	2.6	1.6	-	-	-	3	-	2	2	3	2	2

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

23ADI31

DATA EXPLORATION AND VISUALIZATION

(for B.Tech.- AIDS)

L	T	P	C
3	0	2	4

COURSE OBJECTIVES:

- To outline an overview of exploratory data analysis.
- To implement data visualization using Matplotlib.
- To perform univariate data exploration and analysis.
- To apply bivariate data exploration and analysis.
- To use Data exploration and visualization techniques for multivariate and time series data.

UNIT-I**EXPLORATORY DATA ANALYSIS****9**

EDA fundamentals – Understanding data science – Significance of EDA – Making sense of data – Comparing EDA with classical and Bayesian analysis – Software tools for EDA - Visual Aids for EDA- Data transformation techniques-merging database, reshaping and pivoting, Transformation techniques - Grouping Datasets - data aggregation – Pivot tables and cross-tabulations.

UNIT-II**VISUALIZING USING MATPLOTLIB****9**

Importing Matplotlib – Simple line plots – Simple scatter plots – visualizing errors – density and contour plots – Histograms – legends – colors – subplots – text and annotation – customization –three dimensional plotting - Geographic Data with Base map - Visualization with Seaborn.

UNIT-III**UNIVARIATE ANALYSIS****9**

Introduction to Single variable: Distributions and Variables - Numerical Summaries of Level and Spread - Scaling and Standardizing – Inequality - Smoothing Time Series.

UNIT-IV**BIVARIATE ANALYSIS****9**

Relationships between Two Variables - Percentage Tables - Analyzing Contingency Tables - Handling Several Batches – Scatter plots and Resistant Lines – Transformations.

UNIT-V**MULTIVARIATE AND TIME SERIES ANALYSIS****9**

Introducing a Third Variable - Causal Explanations - Three-Variable Contingency Tables and Beyond - Longitudinal Data – Fundamentals of TSA – Characteristics of time series data – Data Cleaning – Time-based indexing – Visualizing – Grouping – Resampling.

TOTAL : 30 PERIODS

PRACTICAL EXERCISES:

1. Install the data Analysis and Visualization tool: R/ Python /Tableau Public/ Power BI.
2. Perform exploratory data analysis (EDA) on with datasets like email data set. Export all your emails as a dataset, import them inside a pandas data frame, visualize them and get different in sights from the data.
3. Working with Numpy arrays, Pandas data frames , Basic plots using Matplotlib.
4. Explore various variable and row filters in R for cleaning data. Apply various plot features in Ron sample data sets and visualize.
5. Perform Time Series Analysis and apply the various visualization techniques.
6. Perform Data Analysis and representation on a Map using various Map data sets with Mouse Rollover effect, user interaction, etc..
7. Build cartographic visualization for multiple datasets involving various countries of the world; states and districts in India etc.
8. Perform EDA on Wine Quality Data Set.
9. Use a case study on a data set and apply the various EDA and visualization techniques and present an analysis report.

COURSE OUTCOMES:

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

- CO1 :** Understand the fundamentals of exploratory data analysis.
- CO2 :** Implement the data visualization using Matplotlib.
- CO3 :** Perform univariate data exploration and analysis.
- CO4 :** Apply bivariate data exploration and analysis.
- CO5 :** Use Data exploration and visualization techniques for multivariate and time series data.

TEXT BOOKS:

1. Suresh Kumar Mukhiya, Usman Ahmed, "Hands-On Exploratory Data Analysis with Python", Packt Publishing, 2020. (Unit 1)
2. Jake Vander Plas, "Python Data Science Handbook: Essential Tools for Working with Data", Oreilly, 1st Edition, 2016. (Unit 2)
3. Catherine Marsh, Jane Elliott, "Exploring Data: An Introduction to Data Analysis for Social Scientists", Wiley Publications, 2nd Edition, 2008. (Unit 3,4,5)

REFERENCE BOOKS:

1. Eric Pimpler, Data Visualization and Exploration with R, GeoSpatial Training service, 2017.
2. Claus O. Wilke, "Fundamentals of Data Visualization", O'reilly publications, 2019.
3. Matthew O. Ward, Georges Grinstein, Daniel Keim, "Interactive Data Visualization: Foundations, Techniques, and Applications", 2nd Edition, CRC press, 2015.

E-RESOURCES:

1. <https://nptel.ac.in/courses/10610407>

CO's – PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C01	3	1	3	3	-	-	-	-	2	3	3	3	2	2	2
C02	2	2	2	1	1	-	-	-	3	2	3	1	3	1	3
C03	2	1	2	1	1	-	-	-	3	2	1	2	2	2	1
C04	2	2	2	1	-	-	-	-	1	2	1	3	1	3	2
C05	3	1	1	2	1	-	-	-	3	2	1	2	2	2	3
AVG	2	1	2	2	1	-	-	-	2	2	2	2	2	2	2

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


Chairman
BoS/CSE&IT

23EC132

DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION

(for BE/B.Tech- CSE, AI&DS and IT)

L	T	P	C
3	0	2	4

COURSE OBJECTIVES:

- > To analyze and design combinational circuits
- > To analyze and design sequential circuits
- > To understand the basic structure and operation of a digital computer.
- > To study the design of data path unit, control unit for processor and to familiarize with the hazards.
- > To understand the concept of various memories and I/O interfacing.

UNIT-I

COMBINATIONAL LOGIC

9

Combinational Circuits - Karnaugh Map - Analysis and Design Procedures - Binary Adder - Subtractor - Decimal Adder - Magnitude Comparator - Decoder - Encoder - Multiplexers - Demultiplexers

UNIT-II

SYNCHRONOUS SEQUENTIAL LOGIC

9

Introduction to Sequential Circuits - Flip-Flops - operation and excitation tables, Triggering of FF, Analysis and design of clocked sequential circuits - Design - Moore/Mealy models, state minimization, state assignment, circuit implementation - Registers - Counters.

UNIT-III

COMPUTER FUNDAMENTALS

9

Functional Units of a Digital Computer: Von Neumann Architecture - Operation and Operands of Computer Hardware Instruction - Instruction Set Architecture (ISA): Memory Location, Address and Operation - Instruction and Instruction Sequencing - Addressing Modes, Encoding of Machine Instruction - Interaction between Assembly and High Level Language.

UNIT-IV

DATAPATH AND CONTROL DESIGN

9

Instruction Execution - Building a Data Path- ALU - Designing a Control Unit - Hardwired Control, Microprogrammed Control - Pipelining - Data Hazard - Control Hazards.

UNIT-V

MEMORY AND I/O

9

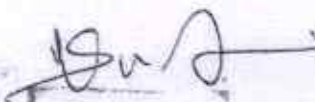
Memory Concepts and Hierarchy - Memory Management - Cache Memories: Mapping and Replacement Techniques - Virtual Memory - DMA - I/O - Accessing I/O: Parallel and Serial Interface - Interrupt I/O - Interconnection Standards: USB, SATA

TOTAL: 45 PERIODS

PRACTICAL EXERCISES:

1. Verification of Boolean theorems using logic gates.
2. Design and implementation of combinational circuits using gates for arbitrary functions.
3. Implementation of 4-bit binary adder/subtractor circuits.
4. Implementation of code converters
5. Implementation of BCD adder, encoder and decoder circuits

SVHEC-R2023


Chairman
BoS / ECE

6. Implementation of functions using Multiplexers.
7. Implementation of the synchronous counters
8. Implementation of a Universal Shift register.
9. Simulator based study of Computer Architecture

PRACTICAL: 30 PERIODS
TOTAL (45+30): 75 PERIODS

COURSE OUTCOMES:

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

- CO1: Design various combinational digital circuits using logic gates.
- CO2: Design sequential circuits and analyze the design procedures.
- CO3: State the fundamentals of computer systems and analyze the execution of an instruction.
- CO4: Analyze different types of control design and identify hazards.
- CO5: Identify the characteristics of various memory systems and I/O communication.

TEXT BOOKS:

- 1.M. Morris Mano, Michael D. Ciletti, "Digital Design : With an Introduction to the Verilog HDL, VHDL, and System Verilog", Sixth Edition, Pearson Education, 2018.
- 2.David A. Patterson, John L. Hennessy, "Computer Organization and Design, The Hardware/Software Interface", Sixth Edition, Morgan Kaufmann/Elsevier, 2020.

REFERENCE BOOKS:

- 1.Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Naraig Manjikian, "Computer Organization and Embedded Systems", Sixth Edition, Tata McGraw-Hill, 2012.
2. William Stallings, "Computer Organization and Architecture - Designing for Performance", Tenth Edition, Pearson Education, 2016.
3. M. Morris Mano, "Digital Logic and Computer Design", Pearson Education, 2016.

E-RESOURCES:

1. NPTEL-Online Courses and Video lectures: <https://nptel.ac.in/>

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

CO/ PO/ PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	2	1	1	1	1	2	3	2	3	3
CO2	3	3	3	3	2	1	1	1	1	1	2	3	1	2	2
CO3	3	3	3	3	2	2	1	1	1	1	2	3	2	3	1
CO4	3	3	3	3	1	1	1	1	1	1	1	2	1	3	1
CO5	3	3	3	3	1	2	1	1	1	1	1	2	1	2	1
AVG	3	3	3	3	1.8	1.6	1	1	1	1	1.6	2.6	1.4	2.6	1.6

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

23EST31

ENTREPRENEURSHIP AND STARTUP
(Common to: B.E / B.Tech. all Branches)

L	T	P	C
1	0	0	1

Course Objectives:

The main learning objective of this course is to prepare the students :

- To develop a knowledge on basic concepts of entrepreneurship.
- To know about business opportunities and project evaluation criteria.
- To explore the concept of startups, government schemes and other financial institutions support

UNIT-I

ENTREPRENEURSHIP CONCEPTS

5

Entrepreneurship-Meaning-Origin-Functions-Factors Affecting Entrepreneurial Growth- - Role of Entrepreneurship in Economic Development- Skills required for an Entrepreneur - Barriers to Entrepreneurship - Stages in Entrepreneurial Process.

UNIT-II

PROJECT FORMULATION AND IDENTIFICATION

5

Identification of business opportunities -Project formulation- Project Classification and Identification - Project Objectives - Technical Analysis, Financial Analysis – Environmental Appraisal of Project - EDP Phases - Project Report Preparation.

UNIT-III

START UP OPPORTUNITIES AND FINANCE

5

The New Industrial Revolution- Business Start-up - Rise of the startup Economy- Government Initiatives - Government schemes and incentives - Institutional service to entrepreneur - Sources of Finance.

TOTAL : 15 PERIODS

COURSE OUTCOMES:

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

- CO1: Enhanced the knowledge of entrepreneurship qualities and skills to startup a business.
- CO2: Understand the project classification and prepare a feasibility report.
- CO3: Provide vision for the own Start-up and its importance for economic development.

TEXT BOOKS:

1. Gupta C.B and Srinivasan N.P- Entrepreneurial development-Sultan Chand and Sons- Latest edition.
2. Khanka S.S.-Entrepreneurial Development-S.Chand& Co, RamNagar, New Delhi, Latest edition.

REFERENCE BOOKS:

1. Vasant Desai-Project Management and Entrepreneurship-Himalaya Publishing House,2023
2. P.Narayana Reddy – Entrepreneurship Text and Cases- cengage learning.2022
3. Prasanna Chandra- Projects planning, analysis, selection, implementation and review Tata McGraw-Hill Publishing Co, Latest edition.
4. Donald F.Kuratko- Entrepreneurship theory, process & practice-9th Edition-Cengage Learning,2022.

E-RESOURCES:

1. http://nptel.ac.in/courses/122106032/Pdf/7_2.pdf, "Business Plan", Dr.T. J.Kamalanabhan, Indian Institute of Technology Madras.
2. <http://www.nptel.ac.in/syllabus/110104049/>, "Entrepreneurial Finance", Dr. B.V. Phani, IIT Kanpur.
3. http://nptel.ac.in/noc20_mg35/ Entrepreneurship and Start up

CO, PO & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	-	1	-	-	-	-	-	-	-	3	2	2
CO2	2	3	1	3	-	-	-	-	-	-	-	-	2	1	2
CO3	1	-	3	2	2	-	-	-	-	-	-	-	1	3	2
Avg	2	2	2	1.6	1	-	-	-	-	-	-	-	2	2	2

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

23CSL31

DATA SCIENCE LABORATORY
(for B.E./B.Tech. – CSE, IT, and AIDS)

L	T	P	C
0	0	4	2

COURSE OBJECTIVE

- To understand the python libraries for data science
- To understand the basic Statistical and Probability measures for data science.
- To learn descriptive analytics on the benchmark data sets.
- To apply correlation and regression analytics on standard data sets.
- To present and interpret data using visualization packages in Python

LIST OF EXPERIMENTS

1. Download, install and explore the features of NumPy, SciPy, Jupyter, Statsmodels and Pandas packages.
2. Working with Numpy arrays
3. Working with Pandas data frames
4. Reading data from text files, Excel and the web and exploring various commands for doing descriptive analytics on the Iris data set.
5. Use the diabetes data set from UCI and Pima Indians Diabetes data set for performing the following:
 - a. Univariate analysis: Frequency, Mean, Median, Mode, Variance, Standard Deviation, Skewness and Kurtosis.
 - b. Bivariate analysis: Linear and logistic regression modeling
 - c. Multiple Regression analysis
 - d. Also compare the results of the above analysis for the two data sets.
6. Apply and explore various plotting functions on UCI data sets.
 - a. Normal curves
 - b. Density and contour plots
 - c. Correlation and scatter plots
 - d. Histograms
 - e. Three dimensional plotting
7. Visualizing Geographic Data with Basemap

List of Equipments:(30 Students per Batch)

Tools: Python, Numpy, Scipy, Matplotlib, Pandas, statmodels, seaborn, plotly, bokeh

Note: Example data sets like: UCI, Iris, Pima Indians Diabetes etc.

TOTAL : 60 PERIODS**COURSE OUTCOMES:**

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

- CO1 :** Make use of the python libraries for data science.
- CO2 :** Make use of the basic Statistical and Probability measures for data science.
- CO3 :** Perform descriptive analytics on the benchmark data sets.
- CO4 :** Perform correlation and regression analytics on standard data sets.
- CO5 :** Present and interpret data using visualization packages in Python.

E-RESOURCES:

1. <https://nptel.ac.in/courses/106106179>
2. <https://nptel.ac.in/courses/106106212>

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C01	3	2	1	1	-	-	-	-	1	3	3	3	1	3	2
C02	3	2	2	3	1	-	-	-	3	1	3	2	1	3	3
C03	3	2	1	3	1	-	-	-	2	1	1	1	3	2	3
C04	2	3	1	3	-	-	-	-	2	3	2	3	3	3	1
C05	1	2	3	1	1	-	-	-	2	1	3	1	1	3	3
AVG	2	2	2	2	1	-	-	-	2	2	2	2	2	3	2

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


Chairman
 BoS/CSE&IT

23ITL31

DATA STRUCTURES AND ALGORITHMS LABORATORY
 (for B.Tech. – IT, AIDS)

L	T	P	C
0	0	4	2

COURSE OBJECTIVES:

- To implement ADTs in Python
- To design and implement linear data structures –lists, stacks, and queues
- To implement sorting, searching and hashing algorithms
- To solve problems using tree structures with searching
- To apply Graph structures to solve problems

LIST OF EXPERIMENTS

1. Implement simple ADTs as Python classes
2. Implement recursive algorithms in Python
3. Implement List ADT using Python arrays
4. Linked list implementations of List
5. Implementation of Stack and Queue ADTs
6. Applications of List, Stack and Queue ADTs
7. Implementation of sorting and searching algorithms
8. Implementation of Hash tables
9. Tree representation and traversal algorithms
10. Implementation of Binary Search Trees
11. Implementation of Heaps
12. Graph representation and Traversal algorithms
13. Implementation of single source shortest path algorithm
14. Implementation of minimum spanning tree algorithms

TOTAL: 60 PERIODS**COURSE OUTCOMES:****At the end of the course the students will be able to**

- CO1:** Implement ADTs as Python classes
- CO2:** Design, implement, and analyze linear data structures, such as lists, queues, and stacks, According to the needs of different applications
- CO3:** Design, implement, and analyze efficient tree structures to meet requirements such as searching, indexing, and sorting
- CO4:** Implement Tree structures to solve the searching problems.
- CO5:** Model problems as graph problems and implement efficient graph algorithms to solve them.

TEXT BOOKS:

1. Michael T. Goodrich, Roberto Tamassia, and Michael H. Goldwasser, "Data Structures & Algorithms in Python", John Wiley & Sons Inc., 2013

REFERENCE BOOKS:

1. Rance D. Necaise, "Data Structures and Algorithms Using Python", John Wiley & Sons, 2011
2. Aho, Hopcroft, and Ullman, "Data Structures and Algorithms", Pearson Education, 1983.
3. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, "Introduction to Algorithms", Second Edition, McGraw Hill, 2002.
4. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Fourth Edition, Pearson Education, 2014.
5. Martin C. Brown, "Python: The Complete Reference", 4th Edition, McGraw 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	2	1	1	1	-	-	-	2	3	1	2	1	2	1
CO2	3	3	2	-	1	-	-	-	2	3	1	2	2	2	1
CO3	2	2	2	1	1	-	-	-	2	3	1	2	1	3	1
CO4	3	1	2	1	1	-	-	-	2	3	1	2	1	3	1
CO5	3	1	2	1	1	-	-	-	2	3	1	2	1	3	1
AVG	2.8	1.8	1.8	0.8	1				2	3	1	2	1.2	2.6	1

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

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23MAT42

**PROBABILITY AND LINEAR ALGEBRA
(for B.Tech. AI&DS)**

**L T P C
3 1 0 4**

COURSE OBJECTIVES:

- To introduce the basic concepts of probability and random variables.
- To develop an understanding of distribution functions.
- To introduce the basic concepts of two dimensional random variables.
- To introduce the basic notions of vector spaces which will then be used to solve related problems
- To understand the concepts of vector space, linear Transformations, inner product spaces and orthogonalization

UNIT-I

PROBABILITY AND RANDOM VARIABLES

9+3

Axioms of probability – Conditional probability – Baye's theorem - Discrete and continuous random variables – Moments – Moment generating functions

UNIT-II

DISTRIBUTION FUNCTIONS

9+3

Discrete distributions - Binomial, Poisson and Geometric , Continuous distributions - Uniform, Exponential, Gamma and Normal distributions

UNIT-III

TWO-DIMENSIONAL RANDOM VARIABLES

9+3

Joint distributions – Marginal and conditional distributions – Covariance – Correlation and linear regression.

UNIT-IV

VECTOR SPACES

9+3

Vector spaces – Subspaces – Linear combinations and linear system of equations – Linear independence and linear dependence – Bases and dimensions.

UNIT-V

LINEAR TRANSFORMATION AND INNER PRODUCT SPACES

9+3

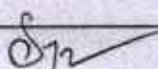
Linear transformation - Null spaces and ranges - Dimension theorem – Matrix representation of a linear transformations - Inner product - Norms – Gram Schmidt orthogonalization process - Adjoint of linear operations – Least square approximation

TOTAL : 60 PERIODS

TEXT BOOKS:

1. Johnson. R.A., Miller. I and Freund. J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 9th Edition, 2016.
2. Milton. J. S. and Arnold. J.C., "Introduction to Probability and Statistics", Tata McGraw Hill, 4th Edition, 2007.

SVHEC-R2023


**Chairman
BoS / S&H**

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

3. Grewal.B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition, 2018.

REFERENCE BOOKS:

1. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8th Edition, 2014.
2. Papoulis. A. and Unnikrishnapillai . S., "Probability, Random Variables and Stochastic Processes", McGraw Hill Education India, 4th Edition, New Delhi, 2010.
3. Ross . S.M., "Introduction to Probability and Statistics for Engineers and Scientists", 5th Edition, Elsevier, 2014.
4. Spiegel. M.R., Schiller. J. and Srinivasan . R.A., "Schaum's Outline of Theory and Problems of Probability and Statistics", Tata McGraw Hill Edition, 4th Edition, 2012.
5. Kreyszig, E., "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New Delhi, 2016.

COURSE OUTCOME:

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

- CO1:** Understand the fundamental knowledge of the concepts of probability which can describe real life phenomenon
- CO2:** Understand the basic concepts standard distributions engineering problems
- CO3:** Understand the basic concepts of two dimensional random variables and apply in engineering problems
- CO4:** Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts
- CO5:** Demonstrate accurate and efficient use of advanced algebraic techniques

CO's - PO's MAPPING:

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

1- Low, 2- Medium, 3-High, "-" No Correlation

SVHEC-R2023


Chairman
BoS / S&H

23ADT41**MACHINE LEARNING**
(for B.Tech -AIDS)

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To understand the basic concepts of machine learning.
- To understand and build supervised learning models.
- To understand and build unsupervised learning models.
- To evaluate the algorithms based on corresponding metrics identified.
- To apply Algorithms for Design and Analysis of Machine learning experiments.

UNIT I	INTRODUCTION TO MACHINE LEARNING	8
---------------	---	----------

Review of Linear Algebra for machine learning; Introduction and motivation for machine learning; Examples of machine learning applications, Vapnik- Chervonenkis (VC) dimension, Probably Approximately Correct (PAC) learning, Hypothesis spaces, Inductive bias, Generalization, Bias variance trade-off.

UNIT II	SUPERVISED LEARNING	11
----------------	----------------------------	-----------

Linear Regression Models: Least squares, single & multiple variables, Bayesian linear regression, gradient descent, Linear Classification Models: Discriminant function – Perceptron algorithm, Probabilistic discriminative model - Logistic regression, Probabilistic generative model – Naive Bayes, Maximum margin classifier – Support vector machine, Decision Tree, Random Forests

UNIT III	ENSEMBLE TECHNIQUES AND UNSUPERVISED LEARNING	9
-----------------	--	----------

Combining multiple learners: Model combination schemes, Voting, Ensemble Learning - bagging, boosting, stacking, Unsupervised learning: K-means, Instance Based Learning: KNN, Gaussian mixture models and Expectation maximization

UNIT IV	NEURAL NETWORKS	9
----------------	------------------------	----------

Multilayer perceptron, activation functions, network training – gradient descent optimization – stochastic gradient descent, error back propagation, from shallow networks to deep networks – Unit saturation (aka the vanishing gradient problem) – ReLU, hyper parameter tuning, batch normalization, regularization, dropout.

UNIT V	DESIGN AND ANALYSIS OF MACHINE LEARNING EXPERIMENTS	8
---------------	--	----------

Guidelines for machine learning experiments, Cross Validation(CV) and re sampling-K-fold CV, bootstrapping, measuring classifier performance, assessing a single classification algorithm and comparing two classification algorithms – t test, McNemar's test, K-fold CV paired t test

COURSE OUTCOMES:

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

- CO1:** Explain the basic concepts of machine learning.
- CO2:** Construct supervised learning models.
- CO3:** Construct unsupervised learning algorithms.
- CO4:** Evaluate and compare different models
- CO5:** Implement the Algorithms for Machine Learning experiments.

TEXT BOOKS:

1. Ethem Alpaydin, "Introduction to Machine Learning", MIT Press, Fourth Edition, 2020.
2. Stephen Marsland, "Machine Learning: An Algorithmic Perspective", "Second Edition", CRC Press, 2014.

REFERENCE BOOKS:

1. Christopher M. Bishop, "Pattern Recognition and Machine Learning", Springer, 2006.
2. Tom Mitchell, "Machine Learning", McGraw Hill, 3rd Edition, 1997.
3. Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar, "Foundations of Machine Learning", Second Edition, MIT Press, 2012, 2018.
4. Ian Goodfellow, Yoshua Bengio, Aaron Courville, "Deep Learning", MIT Press, 2016
5. Sebastain Raschka, Vahid Mirjalili, "Python Machine Learning", Packt publishing, 3rd Edition, 2019.

E-RESOURCES:

<https://nptel.ac.in/courses/106106139>

<https://nptel.ac.in/courses/106106202>

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

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	1	2	1	-	-	-	-	3	3	2	2	2	2	1
CO2	1	3	3	1	2	-	-	-	2	2	2	1	3	1	1
CO3	2	1	3	3	2	-	-	-	1	1	1	1	1	2	1
CO4	2	3	3	2	1	-	-	-	3	2	3	2	1	2	1
CO5	1	1	3	3	1	-	-	-	3	1	1	3	3	3	2
AVG	2	2	3	2	2	-	-	-	2	2	2	2	2	2	1

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


Chairman
BOS/CSE&IT

23ADT42

DATABASE DESIGN AND MANAGEMENT
 (for B.Tech. -AIDS)

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To introduce database development life cycle and conceptual modeling
- To learn SQL for data definition, manipulation and querying a database
- To learn relational database design using conceptual mapping and normalization
- To learn transaction concepts and serializability of schedules
- To learn data model and querying in object-relational and No-SQL databases

UNIT-I**CONCEPTUAL DATA MODELING****8**

Database environment – Database system development lifecycle – Requirements collection – Database design -- Entity-Relationship model – Enhanced-ER model – UML class diagrams.

UNIT-II**RELATIONAL MODEL AND SQL****10**

Relational model concepts -- Integrity constraints -- SQL Data manipulation – SQL Data definition – Views -- SQL programming.

UNIT-III**RELATIONAL DATABASE DESIGN AND NORMALIZATION****10**

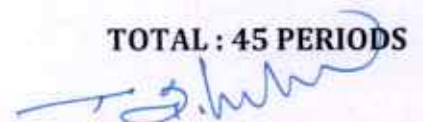
ER and EER-to-Relational mapping – Update anomalies – Functional dependencies – Inference rules – Minimal cover – Properties of relational decomposition – Normalization (upto BCNF).

UNIT-IV**TRANSACTION MANAGEMENT****8**

Transaction concepts – properties – Schedules – Serializability – Concurrency Control – Two-phase locking techniques.

UNIT-V**OBJECT RELATIONAL AND NO-SQL DATABASES****9**

Mapping EER to ODB schema – Object identifier – reference types – row types – UDTs – Subtypes and super types – user-defined routines – Collection types – Object Query Language; No-SQL: CAP theorem – Document-based: Mongo DB data model and CRUD operations; Column-based: Hbase data model and CRUD operations.

TOTAL : 45 PERIODS

Chairman
BoS/CSE&IT

COURSE OUTCOMES:

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

- CO1 :** Understand the database development life cycle and apply conceptual modeling.
- CO2 :** Apply SQL and programming in SQL to create, manipulate and query the database
- CO3 :** Apply the conceptual-to-relational mapping and normalization to design relational database
- CO4 :** Determine the serializability of any non-serial schedule using concurrency techniques
- CO5 :** Apply the data model and querying in Object-relational and No-SQL databases.

TEXT BOOKS:

1. Thomas M. Connolly, Carolyn E. Begg, Database Systems – A Practical Approach to Design, Implementation, and Management, Sixth Edition, Global Edition, Pearson Education, 2015.
2. Ramez Elmasri, Shamkant B. Navathe, Fundamentals of Database Systems, 7th Edition, Pearson, 2017.

REFERENCE BOOKS:

1. Toby Teorey, Sam Lightstone, Tom Nadeau, H. V. Jagadish, "DATABASE MODELING AND DESIGN - Logical Design", Fifth Edition, Morgan Kaufmann Publishers, 2011.
2. Carlos Coronel, Steven Morris, and Peter Rob, Database Systems: Design, Implementation, and Management, Ninth Edition, Cengage learning, 2012
3. Abraham Silberschatz, Henry F Korth, S Sudharshan, "Database System Concepts", 6th Edition, Tata Mc Graw Hill, 2011.
4. Hector Garcia-Molina, Jeffrey D Ullman, Jennifer Widom, "Database Systems: The Complete Book", 2nd edition, Pearson.

E-RESOURCES:

1. <https://nptel.ac.in/courses/>

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	3	3	-	-	-	-	3	1	2	1	2	3	3
CO2	2	3	1	3	1	-	-	-	1	2	2	1	3	3	3
CO3	2	2	2	1	1	-	-	-	2	3	1	2	1	1	2
CO4	2	2	3	1	-	-	-	-	1	2	1	2	2	2	2
CO5	3	1	3	2	1	-	-	-	1	3	1	1	2	1	1
AVG	2	2	2	2	1	-	-	-	2	2	1	1	2	2	2

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


Chairman
BASICSE&IT

23ADT43

ARTIFICIAL INTELLIGENCE
 (for B.Tech -AIDS)

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- Learn the basic AI approaches
- Develop problem solving agents
- Perform logical and probabilistic reasoning

UNIT-I**INTELLIGENTAGENTS****9**

Introduction to AI-Agents and Environments-concept to rationality -nature of environments - structure of agents. Problem solving agents - search algorithms - uninformed search strategies.

UNIT-II**PROBLEMSOLVING****9**

Heuristic search strategies - heuristic functions. Local search and optimization problems - local search in continuous space - search with non-deterministic actions - search in partially observable environments - online search agents and unknown environments.

UNIT-III**GAMEPLAYINGANDCSP****9**

Game theory -optimal decisions in games -alpha-beta search -monte-carlo tree search-stochastic games - partially observable games. Constraint satisfaction problems - constraint propagation-backtracking search for CSP-local search for CSP-structure of CSP.

UNIT-IV**LOGICALREASONING****9**

Knowledge-based agents - propositional logic - propositional theorem proving - propositional model checking - agents based on propositional logic. First-order logic - syntax and semantics -knowledge representation and engineering - inferences in first-order logic - forward chaining - backward chaining - resolution.

UNIT-V**PROBABILISTICREASONING****9**

Acting under uncertainty -Bayesian inference -naïve Bayes models. Probabilistic reasoning - Bayesian networks-exact inference in BN-approximate inference in BN-causal networks.

TOTAL:45PERIODS

Chairman
 B.Tech/CSEA/IT

COURSE OUTCOMES:

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

- CO1:** Explain intelligent agent frameworks
- CO2:** Apply problem solving techniques
- CO3:** Apply game playing and CSP techniques
- CO4:** Perform logical reasoning
- CO5:** Perform probabilistic reasoning under uncertainty

TEXT BOOKS:

1. Stuart Russell and Peter Norvig, "Artificial Intelligence–A Modern Approach ", Fourth Edition, Pearson Education, 2021.

REFERENCE BOOKS:

1. Dan W.Patterson , "Introduction to AI and ES", Pearson Education, 2007
2. Kevin Night, Elaine Rich, and NairB., "Artificial Intelligence", McGrawHill, 2008
3. Patrick H.Winston, "Artificial Intelligence", Third Edition, Pearson Education, 2006
4. Deepak Khemani, "Artificial Intelligence", Tata McGraw Hill Education, 2013.

E-RESOURCES:

1. <https://nptel.ac.in/courses/106102220>
2. <https://nptel.ac.in/courses/106105077>

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C01	3	1	3	3	-	-	-	-	2	3	3	1	2	1	1
C02	2	2	1	1	1	-	-	-	2	2	3	1	3	2	2
C03	2	1	2	1	-	-	-	-	2	1	1	3	1	2	1
C04	2	1	2	2	-	-	-	-	2	1	2	2	1	3	3
C05	3	2	2	1	1	-	-	-	3	2	1	2	2	2	1
AVG	2	1	2	2	1	-	-	-	2	2	2	2	2	2	2

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


Chairman
B&S/CSE&IT

23CSI41

OPERATING SYSTEMS

- (for B.E./B.Tech. –CSE, IT and AIDS)

L	T	P	C
3	0	2	4

COURSE OBJECTIVES:

- To understand the basics and functions of operating systems.
- To understand Processes and Threads
- To analyze Scheduling algorithms and process synchronization.
- To understand the concept of Deadlocks.
- To analyze various memory management schemes.
- To be familiar with I/O management and File systems.
- To be familiar with the basics of virtual machines and Mobile OS like iOS and Android

UNIT-I**INTRODUCTION****9**

Computer System - Elements and organization; Operating System Overview - Objectives and Functions- Evolution of Operating System; Operating System Structures - Operating System Services - User Operating System Interface - System Calls - System Programs - Design and Implementation - Structuring methods.

UNIT-II**PROCESS MANAGEMENT****9**

Processes - Process Concept - Process Scheduling - Operations on Processes - Inter-process Communication; CPU Scheduling - Scheduling criteria - Scheduling algorithms: Threads - Multithread Models - Threading issues; Process Synchronization - The critical-section problem - Synchronization hardware - Semaphores - Mutex - Classical problems of synchronization - Monitors; Deadlock - Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock.

UNIT-III**MEMORY MANAGEMENT****9**

Main Memory - Swapping - Contiguous Memory Allocation - Paging - Structure of the Page Table - Segmentation, Segmentation with paging; Virtual Memory - Demand Paging - Copy on Write - Page Replacement - Allocation of Frames - Thrashing.

UNIT-IV**STORAGE MANAGEMENT****9**

Mass Storage system - Disk Structure - Disk Scheduling and Management; File-System Interface - File concept - Access methods - Directory Structure - Directory organization - File system mounting - File Sharing and Protection; File System Implementation - File System Structure - Directory implementation - Allocation Methods - Free Space Management; I/O Systems - I/O Hardware, Application I/O interface, Kernel I/O subsystem.

UNIT-V**VIRTUAL MACHINES AND MOBILE OS****9**

Virtual Machines – History, Benefits and Features, Building Blocks, Types of Virtual Machines and their Implementations, Virtualization and Operating-System Components; Mobile OS - iOS and Android.

TOTAL: 45 PERIODS**30 PERIODS****PRACTICAL EXERCISES:**

1. Installation of Operating system : Windows/ Linux
2. Illustrate UNIX commands and Shell Programming
3. Process Management using System Calls : Fork, Exec, Getpid, Exit, Wait, Close
4. Write C programs to implement the various CPU Scheduling Algorithms
5. Illustrate the inter process communication strategy
6. Implement mutual exclusion by Semaphores
7. Write a C program to avoid Deadlock using Banker's Algorithm
8. Write a C program to Implement Deadlock Detection Algorithm
9. Write C program to implement Threading
10. Implement the paging Technique using C program
11. Write C programs to implement the following Memory Allocation Methods
 - a. First Fit b. Worst Fit c. Best Fit
12. Write C programs to implement the various Page Replacement Algorithms
13. Write C programs to Implement the various File Organization Techniques
14. Implement the following File Allocation Strategies using C programs
 - a. Sequential b. Indexed c. Linked
15. Write C programs for the implementation of various disk scheduling algorithms

COURSE OUTCOMES:

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

- CO1:** Analyze various scheduling algorithms and process synchronization.
- CO2:** Explain deadlock, prevention and avoidance algorithms.
- CO3:** Compare and contrast various memory management schemes.
- CO4:** Explain the functionality of file systems I/O systems, and Virtualization
- CO5:** Compare iOS and Android Operating Systems.

TEXT BOOKS:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", 9th Edition, John Wiley and Sons Inc., 2018.
2. Andrew S Tanenbaum, "Modern Operating Systems", Pearson, 4th Edition, New Delhi, 2016.

SVHEC-R2023

Chairman
BoS/CSE&IT

REFERENCE BOOKS:

1. Ramaz Elmasri, A. Gil Carrick, David Levine, "Operating Systems – A Spiral Approach", TataMcGraw Hill Edition, 2010.
2. William Stallings, "Operating Systems: Internals and Design Principles", 7th Edition, PrenticeHall, 2018.
3. Achyut S.Godbole, Atul Kahate, "Operating Systems", McGraw Hill Education, 2016
Programming", BCS Learning &Development., 2017

E-RESOURCES:

<https://nptel.ac.in/courses/106108101>

<https://nptel.ac.in/courses/106106144>

CO's – PO's & PSO's MAPPING

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	1	1	1	-	-	-	-	1	1	1	2	2	1	2
CO2	2	3	1	3	1	-	-	-	3	2	2	3	3	3	1
CO3	2	2	3	3	2	-	-	-	3	1	1	2	1	1	1
CO4	2	2	1	2	1	-	-	-	1	3	2	1	1	1	2
CO5	2	3	3	2	1	-	-	-	3	1	2	1	3	1	2
AVG	2	2	2	2	1	-	-	-	2	2	2	2	2	1	2

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

23CYT41	ENVIRONMENTAL SCIENCES AND SUSTAINABILITY	L	T	P	C
	(Common to: B.E./B.Tech. all Branches)	2	0	0	2

Course Objectives:

- To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation.
- To impart knowledge on the causes, effects and control or prevention measures of environmental pollution and natural disasters.
- To facilitate the understanding of global and Indian scenario of renewable and nonrenewable resources, causes of their degradation and measures to preserve them.
- To familiarize the concept of sustainable development goals and sustainable practices
- To imbibe awareness on manmade activities and population issues

UNIT-I ENVIRONMENT AND BIODIVERSITY 6
 Definition, scope and importance of environment – need for public awareness. Eco-system and Energy flow– ecological succession. Types of biodiversity – values of biodiversity, India as a mega-diversity nation – threats to biodiversity – conservation of biodiversity. Activity: Documentation of ecosystems/Biodiversity within Campus.

UNIT-II ENVIRONMENTAL POLLUTION 6
 Causes, Effects and Preventive measures of Water, Soil, Air and Noise Pollutions. Solid, Hazardous and E-Waste management. Case studies on Occupational Health and Safety Management system (OHSMS). Environmental protection, Environmental protection acts. Activity: Documentation of pollution issues in Erode district.

UNIT-III RENEWABLE SOURCES OF ENERGY 6
 Energy management and conservation - New Energy Sources: Need and different types of new energy sources. Concept, origin and applications of - Hydrogen energy, Ocean energy, Tidal energy and geothermal energy conversion. Activity: Documentation of available renewable resources in Erode district.

UNIT-IV SUSTAINABILITY AND MANAGEMENT 6
 Development, GDP, Sustainability- concept, needs and challenges - Sustainable Development Goals - Concept of Carbon Credit, Carbon Footprint. Circular economy, ISO 14000 Series, Material Life Cycle Assessment, Environmental Impact Assessment. Green Engineering. Activity: Documentation of sustainable goals of Tamilnadu.

UNIT-V HUMAN POPULATION AND DISASTER MANAGEMENT 6
 Population growth, Population explosion— Family Welfare Program – Environment and human health. Human rights – HIV/AIDS – Women and Child Welfare – Role of Information Technology in environment and human health – Disaster management: Floods, earthquake, cyclone and landslides. Activity: Documentation of women development schemes in Tamilnadu.

TOTAL :30 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to	
CO1:	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.
CO2:	To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.
CO3:	To identify and apply the understanding of renewable and non-renewable resources
CO4:	To recognize the different goals of sustainable development and sustainability practices and apply them for future development.
CO5:	To aware the population issues and to handle the disaster issues

TEXT BOOKS:

1. Dr. A.Ravikrishnan "Environmental Sciences and Sustainability", 2nd Edition, Sri Krishna Hitech Publishing Company Pvt. Ltd, 2022.
2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2010.
3. Gilbert M.Masters& Wendell P Ela, 'Introduction to Environmental Engineering and Science', 3rd edition, Prentice- Hall of India Pvt. Ltd, New Delhi, 2008.

REFERENCE BOOKS:

1. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT. LTD, New Delhi, 2009.
2. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, Third Edition, 2022.
3. Erach Bharucha "Textbook of Environmental Studies for Undergraduate Courses" Orient Blackswan Pvt. Ltd. 2023.

E- SOURCES:

- Unit 1:** <https://www.youtube.com/watch?v=Ar04qG1P8Es> (IIT ROORKEE NPTEL)&<https://www.youtube.com/watch?v=SHxAOoxhKTA> (IIT KANPUR NPTEL)
- Unit 2:** <https://www.youtube.com/watch?v=17Z34WU257U> (IIT ROORKEE NPTEL)
- Unit 3:** <https://www.youtube.com/watch?v=1kUE0BZtTRc> (NATIONAL GEOGRAPHIC)
- Unit 4:** <https://www.youtube.com/watch?v=Crd3CFq5B4s> (IITM NPTEL)
- Unit 5:** <https://www.youtube.com/watch?v=sMqtwbKc8EA> (FINANCIAL TIMES)

23ADL41

MACHINE LEARNING LABORATORY
 (for B.Tech. –AIDS)

L	T	P	C
0	0	3	1.5

COURSE OBJECTIVES:

- To understand the data sets and apply suitable algorithms for selecting the appropriate features for analysis.
- To learn to implement supervised machine learning algorithms on standard datasets and evaluate the performance.
- To experiment the unsupervised machine learning algorithms on standard datasets and evaluate the performance.
- To build the graph based learning models for standard data sets.
- To compare the performance of different ML algorithms and select the suitable one based on the application

LIST OF EXPERIMENTS

1. For a given set of training data examples stored in a .CSV file, implement and demonstrate the **Candidate-Elimination algorithm** to output a description of the set of all hypotheses consistent with the training examples.
2. Write a program to demonstrate the working of the decision tree based **ID3 algorithm**. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.
3. Build an Artificial Neural Network by implementing the **Back propagation algorithm** and test the same using appropriate data sets.
4. Write a program to implement the **naïve Bayesian classifier** for a sample training data set stored as a .CSV file and compute the accuracy with a few test data sets.
5. Implement **naïve Bayesian Classifier** model to classify a set of documents and measure the accuracy, precision, and recall.
6. Write a program to construct a **Bayesian network** to diagnose CORONA infection using standard WHO Data Set.
7. Apply **EM algorithm** to cluster a set of data stored in a .CSV file. Use the same data set for clustering using the k-Means **algorithm**. Compare the results of these two algorithms.
8. Write a program to implement **k-Nearest Neighbour algorithm** to classify the iris data set. Print both correct and wrong predictions.
9. Implement the non-parametric **Locally Weighted Regression algorithm** in order to fit data points. Select an appropriate data set for your experiment and draw graphs.

TOTAL : 60 PERIODS**List of Equipments:(30 Students per Batch)****The programs can be implemented in either Python or R.**

Chairman
BoS/CSE&IT

COURSE OUTCOMES:

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

- CO1 :** Apply suitable algorithms for selecting the appropriate features for analysis.
- CO2 :** Implement supervised machine learning algorithms on standard datasets and evaluate the performance.
- CO3 :** Apply unsupervised machine learning algorithms on standard datasets and evaluate the performance..
- CO4 :** Build the graph based learning models for standard data sets
- CO5 :** Assess and compare the performance of different ML algorithms and select the suitable one based on the application.

E-RESOURCES:

<https://nptel.ac.in/courses/106106139>

<https://nptel.ac.in/courses/106106202>

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

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	2	1	-	-	-	-	1	2	3	3	3	2	1
CO2	2	1	1	3	2	-	-	-	3	2	3	2	3	1	1
CO3	2	2	1	1	2	-	-	-	1	1	1	1	2	3	3
CO4	2	2	3	3	2	-	-	-	1	2	1	1	1	2	2
CO5	2	2	3	1	2	-	-	-	3	1	1	1	2	1	2
AVG	2	2	2	2	2	-	-	-	2	2	2	2	2	2	2

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

23ADL42

DATABASE DESIGN AND MANAGEMENT LABORATORY

(for B.Tech. -AIDS)

L	T	P	C
0	0	3	1.5

COURSE OBJECTIVES:

- To understand the database development life cycle
- To learn database design using conceptual modeling, Normalization
- To implement database using Data definition, Querying using SQL manipulation and SQL programming
- To implement database applications using IDE/RAD tools
- To learn querying Object-relational databases

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. Database Development Lifecycle:
 - Problem definition and Requirement analysis
 - Scope and Constraints
2. Database design using Conceptual modeling (ER-EER) – top-down approach
 - Mapping conceptual to relational database and validate using Normalization
3. Implement the database using SQL Data definition with constraints, Views
4. Query the database using SQL Manipulation
5. Querying/ Managing the database using SQL
 - Programming Stored Procedures/Functions
 - Constraints and security using Triggers
6. Database design using Normalization–bottom-up approach
7. Develop database applications using IDE/RAD tools(Eg., Net Beans, Visual Studio)
8. Database design using EER-to-ODB mapping/UML class diagrams
9. Object features of SQL-UDTs and sub-types, Tables using UDTs, Inheritance ,Method definition
10. Querying the Object-relational database using Object Query language

TOTAL: 45 PERIODS**HARDWARE:**

- Standalone Desktops

SOFTWARE:

- Postgre SQL

COURSE OUTCOMES:

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

- CO1:** Understand the database development lifecycle
- CO2:** Design relational database using conceptual-to-relational mapping, Normalization
- CO3:** Apply SQL for creation, manipulation and retrieval of data
- CO4:** Develop a database applications for real-time problems
- CO5:** Design and query object-relational databases.



Chairman
BOS/CSE&IT

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
C01	3	1	3	3	-	-	-	-	1	1	1	3	2	2	1
C02	2	2	1	3	1	-	-	-	3	2	3	1	1	1	2
C03	2	1	3	1	-	-	-	-	3	3	1	1	2	1	1
C04	2	2	3	1	-	-	-	-	2	3	2	1	2	1	2
C05	3	3	1	3	1	-	-	-	1	3	2	3	3	3	2
AVG	2	2	2	2	1	-	-	-	2	2	2	2	2	2	2

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


Chairman
 B03/CSEA/IT

23ADL43

ARTIFICIAL INTELLIGENCE LABORATORY
(for B.Tech. -AIDS)

L	T	P	C
0	0	3	1.5

COURSE OBJECTIVES:

- To design and implement search strategies
- To implement game playing techniques
- To implement CSP techniques
- To develop systems with logical reasoning
- To develop systems with probabilistic reasoning

LIST OF EXPERIMENTS

1. Implement basic search strategies – 8-Puzzle, 8 - Queens problem, Cryptarithmic.
2. Implement A* and memory bounded A* algorithms
3. Implement Mini max algorithm for game playing (Alpha-Beta pruning)
4. Solve constraint satisfaction problems
5. Implement propositional model checking algorithms
6. Implement forward chaining, backward chaining, and resolution strategies
7. Build naïve Bayes models
8. Implement Bayesian networks and perform inferences
9. Mini-Project

TOTAL : 45 PERIODS

COURSE OUTCOMES: At the end of the course the students will be able to

C01 : Design and implement search strategies

C02 : Implement game playing and CSP techniques

C03 : Develop logical reasoning systems

C04 : Develop probabilistic reasoning systems

C05 : Process compound data using Python data structures and Utilize Python packages in developing software applications.

E-RESOURCES:

1. <https://nptel.ac.in/courses/106102220>
2. <https://nptel.ac.in/courses/106105077>

CO's – PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C01	2	1	3	3	-	-	-	-	1	1	2	1	3	2	1
C02	1	2	3	3	2	-	-	-	3	2	3	3	3	3	2
C03	3	1	3	3	1	-	-	-	1	3	1	2	1	1	3
C04	2	1	1	1	1	-	-	-	2	3	1	2	2	2	1
C05	3	1	1	1	1	-	-	-	1	3	3	3	3	3	2
AVG	2	1	2	2	1	-	-	-	2	2	2	2	2	2	2

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


Chairman
 BoS/CSE&IT