

SRI VASAVI ENGINEERING COLLEGE (Autonomous)

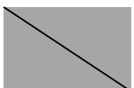
(Permanent Affiliation to JNTUK, Kakinada),
PEDATADEPALLI, TADEPALLIGUDEM-534 101

A.Y: 2022-23

IV SEM AIML Handbook



**Department of
Artificial Intelligence & Machine Learning
Pedatadepalli, Tadepalligudem-534101, A.P**



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INSTITUTE

VISION MISSION

INSTITUTE VISION AND
MISSION

VISION

To be a premier technological institute striving for excellence with global perspective and commitment to the nation.

MISSION

- To produce engineering graduates of professional quality and global perspective through Learner Centric Education.
- To establish linkages with government, industry and research laboratories to promote R&D activities and to disseminate innovations.
- To create an eco-system in the institute that leads to holistic development and ability for life-long learning.

ACADEMIC CALENDAR

✉ : principal@srivasaviengg.ac.in
svec.a8@gmail.com



☎ : 08818- 284344, 355

SRI VASAVI ENGINEERING COLLEGE (AUTONOMOUS)

(Sponsored by Sri Vasavi Educational Society)

(Approved by AICTE, New Delhi & Permanently affiliated to JNTUK, Kakinada)

(Accredited by NAAC with 'A' Grade ,Recognized by UGC under section 2(f) & 12(B))

(NBA Accreditation to B.Tech., EEE,CSE, ME and ECE Branches for 3 Years)

Pedatadepalli, **TADEPALLIGUDEM** – 534 101. W.G.Dist. (A.P)

Principal's Office
Date: 15-02-2023

Revised Academic Calendar **For B.Tech IV Semester, Academic Year 2022-23**

IV Semester			
Description	From	To	Weeks
Commencement of Class Work	27.02.2023		
I Unit of Instructions	27.02.2023	08.04.2023	6 W
I Mid Examinations	10.04.2023	15.04.2023	1 W
II Unit of Instructions	17.04.2023	27.05.2023	6 W
II Mid Examinations	29.05.2023	03.06.2023	1 W
Preparation & Practicals	05.06.2023	10.06.2023	1 W
End Examinations	12.06.2023	24.06.2023	2 W
Summer Internship/ Mini Project	26.06.2023	29.07.2023	
Commencement of Next Semester Class Work (V Semester)	31.07.2023		

PRINCIPAL

Copy to: ALL

Vision

To be a premier technological institute striving for excellence with global perspective and commitment to the nation.

Mission

- To produce Engineering graduates of professional quality and global perspective through learner-centric education.
- To establish linkages with government, industry and Research laboratories to promote R&D activities and to disseminate innovations.
- To create an eco-system in the institute that leads to holistic development and ability for life-long learning.



SRI VASAVI ENGINEERING COLLEGE (Autonomous)

Pedatadepalli, TADEPALLIGUDEM-534 101, W.G. Dist.

Department of Artificial Intelligence and Machine Learning

CLASS CONSOLIDATED TIME TABLE



Class:IV Semester

w.e.f.: 27.02.2023

Section: A

Class Coordinator: Mr. K Lakshmi Narayana

Room No: G-202

Periods	1	2	3	4	1:00PM 2:00PM	5	6	7
Time Day	(09.30 AM- 10.30 AM)	(10.30 AM- 11.20 AM)	(11.20 AM- 12.10 PM)	(12.10 PM- 01.00 PM)		(02.00 PM- 02.50 PM)	(02.50 PM- 03.40 PM)	(03.40 PM- 04.30 PM)
Mon	DAA	OS	AIA	LIBRAR	Lunch Break	JP	COA	DAA
Tue	JP	AI LAB				COA	AIA	OS
Wed	OS	JP	COA	DAA		AIA	JP	SPORTS
Thu	COA	OS	AIA	DAA		JAVA LAB		
Fri	AIA	COA	JP	OS		DAA	PCS-II(VERBAL)	
Sat	PCS-II(APTITUDE)		AIA	JP		OS LAB		

Staff Details:

S. No.	Course Code	Course Name	Section
1.	V20AIT04	Computer Organization and Architecture(COA)	Mrs.D. Anjani Suputri Devi
2.	V20AIT05	Design and Analysis of Algorithms(DAA)	Mr. M. Yesu Shekharam
3.	V20AIT06	Java Programming (JP)	Dr. K. Shirin Bhanu
4.	V20AIT07	Operating Systems(OS)	Mr. K Lakshmi Narayana
5.	V20AIT08	Artificial Intelligence and its Applications(AIA)	Dr.G.Loshma/ Mr. M. Baburao
6.	V20AIL06	Java Programming Lab(JAVA LAB)	Dr. K. Shirin Bhanu/ Mr. G. Sriram Ganesh
7.	V20AIL07	Operating Systems Lab(OS LAB)	Mr. K Lakshmi Narayana / Mrs. D. Anjani Suputri Devi
8.	V20AIL08	Artificial Intelligence Lab(AI LAB)	Dr.G.Loshma/ Ms. M. Pravallika
9.	V20ENT03	Professional Communication Skills –II (PCS-II)	Mr. M Venkata Ramana / Ms. A Kiranmayee

Lab Venues:

S.No.	Name of the Lab Course	Lab Venue
1	Java Programming Lab(JAVA LAB)	James Gosling Lab
2	Operating Systems Lab(OS LAB)	Linus Torvalds Lab
3	Artificial Intelligence Lab(AI LAB)	PGCP Lab

NOTE: Part of Curriculum you have to study Skill Oriented Course-II (V20SOC02) also, It will be conducted any 1 Week during the semester.

Head of the Department

Head of the Department
Dept. of Computer Science & Engineering
Sri Vasavi Engineering College
TADEPALLIGUDEM-534 101

COURSE STRUCTURE

IV Semester

SEMESTER - IV (SECOND YEAR)

S.No.	Code	Name of the Course		L	T	P	C
1	V20AIT04	Computer Organization and Architecture	PCC	3	0	0	3
2	V20AIT05	Design and Analysis of Algorithms	PCC	3	0	0	3
3	V20AIT06	Java Programming	PCC	3	0	0	3
4	V20AIT07	Operating Systems	PCC	3	0	0	3
5	V20AIT08	Artificial Intelligence and its Applications	PCC	3	0	0	3
6	V20AIL06	Java Programming Lab	PCC	0	0	3	1.5
7	V20AIL07	Operating Systems Lab	PCC	0	0	3	1.5
8	V20AIL08	Artificial Intelligence Lab	PCC	0	0	3	1.5
9	V20SOC02	Skill Oriented Course-II*	SO	1	0	0	2
10	V20ENT03	Professional Communication Skills -II	MNC	2	0	0	0
Total:				18	0	11	21.5

Total Contact Hours: 29

Total Credits: 21.5



**LESSON
PLANS**

Computer Organization and Architecture

LESSON PLAN

Academic Year: 2022-23

Programme: B.Tech

Year/ Semester: IV

Name of the Course: Computer Organization and Architecture Course Code: V20AIT04

COURSE OUTCOMES (Along with Knowledge Level):

After completion of this course, the students will be able to:

S.No.	CO No.	Course Outcome
1	C205.1	Illustrate Basic structure of Computers, Instruction types and their addressing modes [K2]
2	C205.2	Describe the different modes of Input / Output transfer. [K2]
3	C205.3	Illustrate different types of Memory. [K2]
4	C205.4	Describe the different types of Control Unit techniques [K2]
5	C205.5	Explain the concept of Pipelining and Parallel processing. [K2]

TEXT BOOKS:

1. Computer Organization, Carl Hamacher, Zvonko Vranesic, Safwat Zaky, 5th Edition, McGraw Hill Education.
2. Computer System Architecture, M. Morris Mano, 3rd Edition, Pearson Education.
3. David A. Patterson and John L. Hennessy, Computer Organization and Design: The Hardware/Software Interface, Fifth Edition, Morgan Kaufmann / Elsevier, 2014.

REFERENCE BOOKS:

1. Computer Organization and Architecture, William Stallings, 10th Edition, Pearson Education.
2. Computer Architecture and Organization, John P. Hayes, 3rd Edition, McGraw Hill Education.

Targeted Proficiency and attainment Levels (for each Course Outcome):

Cos		C01	C02	C03	C04	C05
Targeted Proficiency Level		65	65	65	65	65
Targeted level of Attainment	Level 3	65	65	65	65	65
	Level 2	60	60	60	60	60
	Level 1	55	55	55	55	55

Lecture Plan:

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 1: Introduction & Instruction Sequencing and Addressing Modes	Dissemination of Vision, Mission of the Dept.and PEOs,Pos,&PSOs of the Programme,CO'S and syllabus.		1	Lecture	ICT
2		Describe various Functional units of a computer	K1	1	Lecture	BB
3		Illustrate the Basic Operational concepts	K2	2	Lecture with Discussion	BB/ICT
4		Discuss the Bus structures of computers.	K2	2	Lecture with Discussion	BB/ICT
5		Explain the instructions and instruction sequencing.	K2	2	Lecture with Discussion	BB/ICT
6		Illustrate the various addressing modes of instructions.	K2	3	Lecture with Discussion	BB/ICT
7		Discuss the basic input/output operation of computers.	K2	2	Lecture with Discussion	BB/ICT

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 2: Input/output Organization	Describe the Accessing Input/output devices	K1	2	Lecture	BB/ICT
2		Describe the Interrupts	K2	2	Lecture with Discussion	BB/ICT
3		Discuss the Handling Multiple Devices	K2	1	Lecture with Discussion	BB/ICT
4		Explain the Direct Memory Access.	K2	4	Lecture with Discussion	BB/ICT
5		Explain the Buses and its types.	K2	3	Lecture with Discussion	BB/ICT

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 3: Memory Organization	Describe the memory hierarchy	K1	1	Lecture	BB/ICT
2		Explain the main memory	K2	2	Lecture with Discussion	BB/ICT
3		Illustrate the auxiliary memory	K2	2	Lecture with Discussion	BB/ICT
4		Illustrate the Associative memory.	K2	3	Lecture with Discussion	BB/ICT
5		Illustrate the cache memory	K2	3	Lecture with Discussion	BB/ICT

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 4: Processing Unit	Describe the Fundamental Concepts in execution of instruction.	K1	1	Lecture	BB/ICT
2		Describe the Execution of a Complete Instruction	K2	2	Lecture with Discussion	BB/ICT
3		Explain the Multiple-Bus Organization	K2	2	Lecture with Discussion	BB/ICT
4		Discuss the Hardwired Control unit	K2	2	Lecture with Discussion	BB/ICT
5		Discuss the Micro Programmed Control unit	K2	3	Lecture with Discussion	BB/ICT

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 5: Pipelining & Parallelism	Describe the basic concepts of pipelining.	K2	1	Lecture with Discussion	BB/ICT
2		Discuss the data hazards.	K2	1	Lecture with Discussion	BB/ICT
3		Discuss the instruction hazards	K2	1	Lecture with Discussion	BB+ICT
4		Discuss the parallel processing challenges	K2	1	Lecture with Discussion	BB/ICT
5		Discuss the Flynn's classification	K2	2	Lecture with Discussion	BB/ICT
6		Discuss the Vector Architectures	K2	1	Lecture with Discussion	BB/ICT
7		Discuss the Hardware multithreading	K2	1	Lecture with Discussion	BB/ICT
8		Discuss the Multi-core processors and other Shared Memory Multiprocessors	K2	2	Lecture with Discussion	BB/ICT
9		Discuss the Introduction to Graphics Processing Units, Clusters	K2	2	Lecture with Discussion	BB/ICT
10		Discuss the Warehouse Scale Computers and other Message-Passing Multiprocessors.	K2	2	Lecture with Discussion	BB/ICT

Total No. of Classes: 60

Design and Analysis of Algorithms

LESSON PLAN

Academic Year: 2022-23

Programme: B.Tech

Year/ Semester: IV

Name of the Course: Design and Analysis of Algorithms Course Code: V20AIT05/C211

COURSE OUTCOMES (Along with Knowledge Level):

After completion of this course, the students will be able to:

S.No.	CO No.	Course Outcome
1	C211.1	Demonstrate asymptotic notation and divide and conquer technique [K3]
2	C211.2	Use greedy technique to solve various problems [K3]
3	C211.3	Demonstrate dynamic programming technique to various problems [K3]
4	C211.4	Develop algorithms using backtracking technique [K3]
5	C211.5	Demonstrate branch and bound technique to various problems [K3]

Text Books:

1. Fundamentals of computer algorithms E. Horowitz S. Sahni, University Press.

Reference Books:

1. Introduction to Algorithms Thomas H. Cormen, PHI Learning.
2. The Design and Analysis of Computer Algorithms, Alfred V. Aho, John E. Hopcroft, Jeffrey D.Ullman.
3. Fundamentals of Data Structures and algorithms by C V Sastry, Rakesh Nayak, Ch. Raja Ramesh, Distributed by WILEY publications, New Delhi.
4. Algorithm Design, Jon Kleinberg, Pearson.

Targeted Proficiency and attainment Levels (for each Course Outcome):

Cos		CO1	CO2	CO3	CO4	CO5
Targeted Proficiency Level (Marks In %)		60	60	60	60	60
Targeted level of Attainment	Level 3	60	60	60	60	60
	Level 2	50	50	50	50	50
	Level 1	40	40	40	40	40

Lecture Plan:

UNIT - 1: Introduction , Divide & Conquer						
S. No.	Course Outcome	Intended Learning Outcome (ILO)	Knowledge Level of ILO	No. of Hours Required	Pedagogy	Teaching Aid
1	V20CST06.1	Dissemination of Department Vision, Mission PO's, PSO's and CO's. Define Algorithm, Properties of Algorithm	K1	01	Lecture	ICT/BB
2		Discuss Algorithm Specification-Pseudo Code Conventions, Recursive Algorithms	K2	02	Lecture	ICT/BB
3		Explain Performance Analysis-Space Complexity, Time Complexity	K2	02	Lecture	ICT/BB
4		Describe Asymptotic Notations- Big oh notation, Omega notation, Theta notation and Little oh notation	K2	02	Lecture	ICT/BB
5		Estimate Practical Complexities, Estimate Performance Measurement	K2	02	Lecture	ICT/BB
6		Describe General Method of DAC	K1	01	Lecture	ICT/BB
7		Use Divide and Conquer to Binary Search	K3	02	Lecture + Discussion	ICT/BB
8		Use D&C to Find the minimum and maximum	K2	02	Lecture	ICT/BB
9		Apply Divide and Conquer to Merge Sort	K3	02	Lecture + Discussion	ICT/BB
10		Apply Divide and Conquer to Quick Sort, Performance Measurement	K3	02	Lecture + Discussion	ICT/BB
			Total	18		

UNIT - 2: The Greedy Method						
S. No.	Course Outcome	Intended Learning Outcome (ILO)	Knowledge Level of ILO	No. of Hours Required	Pedagogy	Teaching Aid
1	V20CST06.2	Describe General Method	K1	01	Lecture	ICT/BB
2		Solve Knapsack Problem	K3	02	Lecture + Discussion	ICT/BB
3		Solve Job Sequencing with deadlines	K3	02	Lecture + Discussion	ICT/BB
4		Explain Spanning Trees, Find Minimum Cost Spanning Trees(Prim's and Kruskal's algorithms)	K3	02	Lecture + Discussion	ICT/BB
5		Choose Optimal Merge Patterns	K3	02	Lecture + Discussion	ICT/BB
6		Solve Single Source Shortest Path Problem	K3	02	Lecture + Discussion	ICT/BB
				Total:	11	

UNIT - 3: Dynamic Programming						
S. No.	Course Outcome	Intended Learning Outcome (ILO)	Knowledge Level of ILO	No. of Hours Required	Pedagogy	Teaching Aid
1	V20CST06.3	Solve Single Source shortest Paths General Weights	K3	02	Lecture + Discussion	ICT/BB
2		Solve All Pairs Shortest Path Problem	K3	02	Lecture + Discussion	ICT/BB
3		Solve 0/1 Knapsack Problem	K3	02	Lecture + Discussion	ICT/BB
4		Explain Optimal Binary Search Trees	K3	02	Lecture + Discussion	ICT/BB
5		Explain String Edition	K3	02	Lecture + Discussion	ICT/BB
6		Solve Reliability Design	K3	03	Lecture + Discussion	ICT/BB
				Total:	13	

UNIT - 4: Backtracking						
S. No.	Course Outcome	Intended Learning Outcome (ILO)	Knowledge Level of ILO	No. of Hours Required	Pedagogy	Teaching Aid
1	V20CST06.4	Explain General method	K2	01	Lecture	ICT/BB

2		Solve N-Queen Problem	K3	01	Lecture + Discussion	ICT/BB
3		Employ Backtracking to solve Sum of Subsets Problem	K3	02	Lecture + Discussion	ICT/BB
4		Demonstrate Graph Coloring	K3	02	Lecture + Discussion	ICT/BB
5		Demonstrate Hamiltonian Cycles	K3	02	Lecture + Discussion	ICT/BB
			Total:	08		

UNIT - 5: Branch and Bound						
S. No.	Course Outcome	Intended Learning Outcome (ILO)	Knowledge Level of ILO	No. of Hours Required	Pedagogy	Teaching Aid
1	V20CST06.5	Describe the General method of Branch and Bound technique	K1	01	Lecture	ICT/BB
2		The 15-Puzzle: an Example, Bounding		01	Lecture + Discussion	ICT/BB
3		Demonstrate the FIFO Branch and Bound solution	K3	01	Lecture + Discussion	ICT/BB
4		Apply Branch and Bound to 0/1 Knapsack problem using LC BB & FIFO BB	K3	03	Lecture + Discussion	ICT/BB
5		Solve Travelling Salesperson problem using LC BB	K3	02	Lecture + Discussion	ICT/BB
6		Basic Concepts of NP-hard and NP-complete problems.		02	Lecture	ICT/BB
			Total:	10		

Total Number of Hours: 60

Java Programming

Academic Year: 2022-23

Programme: B.Tech

Year/ Semester: IV

Name of the Course: Java Programming

Course Code: **V20AIT06/C214**

COURSE OUTCOMES (Along with Knowledge Level):
After completion of this course, the students will be able to:

S.No.	CO No.	Course Outcome
1	C214.1	Describe Java Virtual Machine and Type Casting. [K2]
2	C214.2	Demonstrate Concepts like Constructors, Arrays, Nested Classes and Command Line Arguments. [K3]
3	C214.3	Implement Concepts of Inheritance and Exception Handling.. [K3]
4	C214.4	Develop Programs on Multi-Threading and Files. [K3]
5	C214.5	Implement Event Handling and Swings [K3]

Text Books:

1. Java Programming, E. Balagurusamy, 4thEdition, TMH.
2. The complete Reference Java, 8thEdition, Herbert Schildt,TMH.
3. Introduction to java programming, Y Daniel Liang, 7 Edition, Pearson.

Reference Books:

1. Core Java: An Integrated Approach, R Nageswara Rao, 7thEdition, Dream Tech
2. Head First Java , Kathy Sierra and Bert Bates, 2nd Edition O'reilly

Targeted Proficiency and attainment Levels (for each Course Outcome):

Cos		CO1	CO2	CO3	CO4	CO5
Targeted Proficiency Level		65	65	60	60	65
Targeted level of Attainment	Level 3	65	60	60	60	65
	Level 2	60	55	55	55	60
	Level 1	55	50	50	50	55

Lecture Plan:

UNIT-I: INTRODUCTION TO JAVA						
S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1		Dissemination of vision, mission, PEOs, POs, PSOs		1	Lecture	PPT
2	CO 1	Recall the Need of Object Oriented Programming and the Principles of Object Oriented Languages	K1	1	Lecture	PPT
3		Explain different applications of OOP	K2	1	Lecture with Discussion	PPT
4		Describe the history of Java	K2	1	Lecture	PPT
5		Discuss about different features of java	K2	1	Lecture with Discussion	PPT
6		Explain about Java Virtual Machine	K2	1	Lecture with Discussion	PPT
7		Discuss about Java Program Structure	K2	1	Lecture with Discussion	PPT
8		Discuss about Variables, Primitive Data types and Identifiers	K2	2	Lecture with Discussion	PPT
9		Discuss about String Class	K2	1	Lecture with Discussion	PPT
10		Discuss Precedence Rules and Associativity	K2	1	Lecture	PPT
11		Illustrate Primitive Type conversion and casting with an example	K2	1	Lecture With Discussion	PPT
12		Discuss briefly about control structures	K2	1	Lecture With Discussion	PPT
			TOTAL		13	

UNIT-II: CLASSES AND OBJECTS

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 2	Explain about classes and objects	K2	2	Lecture With Discussion	PPT
2		Discuss about how to create objects and method declaration	K2	1	Lecture With Discussion	PPT
3		Describe Constructors and Constructor Overloading	K2	2	Lecture With Discussion	PPT
4		Illustrate the use of this keyword with examples	K2	1	Lecture With Discussion	PPT
5		Discuss about the importance of Static keyword	K2	2	Lecture With Discussion	PPT
6		Explain about different types of Arrays	K2	2	Lecture With Discussion	PPT
7		Interpret Command line arguments	K3	1	Lecture With Discussion	PPT
8		Demonstrate Nested Classes	K3	1	Lecture With Discussion	PPT
9		Demonstrate Garbage Collector	K3	1	Lecture With Discussion	PPT
		TOTAL		13		

UNIT-III: INHERITANCE AND EXCEPTION HANDLING						
S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 3	Explain about different types of Inheritance	K2	1	Lecture with Demonstration	PPT
2		Illustrate the use of super keyword and final keyword	K2	1	Lecture with Demonstration	PPT
3		Explain the concept of Method Overriding	K2	1	Lecture with Demonstration	PPT
4		Explain about Abstract class	K2	1	Lecture with Demonstration	PPT
5		Explain about interface	K3	2	Lecture with Demonstration	PPT
6		Illustrate the procedure of creating packages and using packages	K3	2	Lecture with Demonstration	PPT
7		Explain the importance of C LASSPATH	K2	1	Lecture with Demonstration	PPT
8		Describe different types of Exceptions and procedure of Exception Handling	K2	2	Lecture With Discussion	PPT
9		Construct programs using Exception handling techniques like try... catch and finally block	K2	3	Lecture With Discussion	PPT
10		Interpret throw and throws statements with examples	K3	1	Lecture With Discussion	PPT
11		Interpret finally block with examples	K3	1	Lecture With Discussion	PPT
		TOTAL		16		

UNIT-IV: MULTI-THREADING AND FILES						
S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 4	Discuss about thread lifecycle	K3	1	Lecture With Discussion	PPT
2		Illustrate creation of Threads	K3	1	Lecture With Discussion	PPT
3		Interpret Thread Priorities and Thread Synchronization with examples	K3	2	Lecture With Discussion	PPT
4		Illustrate Communication between threads with example program	K3	2	Lecture With Discussion & Seminar	PPT
5		Illustrate various file operations like Reading data from and writing data to files	K3	3	Lecture With Discussion	PPT
7		Demonstrate Random Access Files	K3	1	Lecture With Discussion	PPT
			TOTAL		10	

UNIT-V: EVENT HANDLING AND SWINGS

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1		Explain about applet class and its life cycle	K2	1	Lecture With Discussion	PPT
2	CO 5	Discuss about AWT ,Components and Containers of AWT	K2	2	Lecture With Discussion	PPT
3		Illustrate various Swings Components like Button,label,Checkbox, List boxes, Menu and Scrollbar with example programs	K3	3	Lecture With Discussion	PPT
4		Interpret different types of layout managers with examples	K3	1	Lecture With Discussion	PPT
5		Describe Event Delegation Model	K3	1	Lecture With Discussion	PPT
6		Illustrate Source of Events and Event Listeners	K3	2	Lecture With Discussion	PPT
7		Illustrate Adapter classes with example programs	K3	1	Lecture With Discussion	PPT
			TOTAL		11	

TOTAL HOURS:63

Operating Systems

Academic Year: 2022-23

Programme: B.Tech

Year/ Semester: IV

Name of the Course: Operating Systems

Course Code: V20AIT07/C301

Course Outcomes (Along with Knowledge Level):

After Completing the course Student will be able to:

S. No.	Co No.	Course Outcome
1.	C301.1	Describe Operating System Services and System Calls (K2)
2.	C301.2	Illustrate Process Management Concepts and CPU Scheduling Algorithms (K3)
3.	C301.3	Demonstrate Process Synchronization primitives and Process Deadlocks (K3)
4.	C301.4	Illustrate Memory Management Techniques and Page Replacement Algorithms (K3)
5.	C301.5	Describe File System Concepts and Mass Storage Structures (K2)

Text Books:

1. Operating System Concepts, AbrahamSilberschatz, ,Peter Baer Galvin,Greg Gagne, 9th Edition, John Wiley and Sons Inc., 2012

Reference Books:

1. Operating Systems – Internals and Design Principles, William Stallings, 7th Edition, Prentice Hall, 2012
2. Modern Operating Systems, Andrew S. Tanenbaum, Third Edition, Addison Wesley,2007

Targeted Proficiency and attainment Levels (for each Course Outcome):

Cos		CO1	CO2	CO3	CO4	CO5
Targeted Proficiency Level		65	60	60	60	65
Targeted level of Attainment	Level 3	65	60	60	60	65
	Level 2	55	50	50	50	55
	Level 1	45	40	40	40	45

Lecture Plan:

S. NO.	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours required	Pedagogy	Teaching aids
1	CO 1	Dissemination of Department Vision, Mission, PEOs, POs, PSOs	-	-	-	
		Introduction of OS	K2	1	Lecture with Discussion	BB/ICT
2		Operating-System Structure	K2	1	Lecture with Discussion	BB/ICT
3		Operating-System Services	K2	1	Lecture with Discussion	BB/ICT
4		User and Operating-System Interface	K2	1	Lecture with Discussion	BB/ICT
5		System Calls	K2	1	Lecture with Discussion	BB/ICT
6		Types of System Calls	K2	1	Lecture with Discussion and in class assignment	BB/ICT

SNO	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours required	Pedagogy	Teaching aids
1	CO2	Process Concept and Process Scheduling	K3	2	Lecture with Discussion	BB/ICT
2		Operations On Processes	K3	1	Lecture with Discussion	BB/ICT
3		Inter Process Communication	K3	1	Lecture with Discussion	BB/ICT
4		Threads overview	K3	1	Lecture with Discussion	BB/ICT
5		Multithreading Models	K3	1	Lecture with Discussion	BB/ICT
6		CPU Scheduling Basic Concepts and CPU Scheduling Criteria	K3	1	Lecture with Discussion	BB/ICT
7		CPU Scheduling Algorithms	K3	3	Lecture with Discussion and in class Assignment	BB/ICT

SNO	Course Outcome	Intended Learning Outcomes	Knowledge Level of ILO	No. of Hours required	Pedagogy	Teaching aids
1	C03	Critical Section	K3	1	Lecture with Discussion	BB/ICT
2		Peterson's Solution	K3	1	Lecture with Discussion	BB/ICT
3		Synchronization	K3	1	Lecture with Discussion	BB/ICT
4		Mutex Locks	K3	1	Lecture with Discussion	BB/ICT
5		Semaphores	K3	1	Lecture with Discussion and in class	BB/ICT
6		Classic Problems of	K3	2	Lecture with Discussion and in class	BB/ICT
7		Monitors	K3	1	Lecture with Discussion	BB/ICT
8		System Model and	K3	1	Lecture with Discussion	BB/ICT
9		Methods for Handling	K3	1	Lecture with Discussion	BB/ICT
10		Deadlock Prevention	K3	1	Lecture with Discussion	BB/ICT
11		Deadlock Avoidance	K3	1	Lecture with Discussion and in class	BB/ICT
12		Deadlock Detection	K3	1	Lecture with Discussion	BB/ICT
13		Recovery from	K3	1	Lecture with Discussion	BB/ICT

SN O	Course Outcome	Intended Learning Outcomes (ILO)	Knowledg e Level of ILO	No. of Hours required	Pedagogy	Teachi ng aids
1	C04	Swapping and Contiguous Memory Allocation	K3	1	Lecture with Discussion	BB/ICT
3		Segmentation	K3	1	Lecture with Discussion	BB/ICT
4		Paging	K3	2	Lecture with Discussion and in class Assignment	BB/ICT
5		Structure of the Page Table	K3	1	Lecture with Discussion	BB/ICT
6		Demand Paging	K3	1	Lecture with Discussion	BB/ICT
7		Page Replacement Algorithms	K3	2	Lecture with Discussion and in class Assignment	BB/ICT
8		Allocation of Frames	K3	1	Lecture with Discussion	BB/ICT
9		Thrashing	K3	1	Lecture with Discussion	BB/ICT

SN O	Course Outcome	Intended Learning Outcomes (ILO)	Knowledg e Level of ILO	No. of Hours required	Pedagogy	Teachin g aids
1	C05	Overview of Mass-Storage Structure	K2	1	Lecture with Discussion	BB/ICT
2		Disk Scheduling	K2	2	Lecture with Discussion and in class assignment	BB/ICT
3		File Concept, Access Methods	K2	1	Lecture with Discussion	BB/ICT
4		Directory and Disk Structure	K2	1	Lecture with Discussion	BB/ICT
5		File-System Mounting	K2	1	Lecture with Discussion	BB/ICT
6		File Allocation Methods	K2	1	Lecture with Discussion	BB/ICT

Artificial Intelligence& its applications

Academic Year: 2022-23

Programme: B.Tech

Year/ Semester: IV

Name of the Course: Artificial Intelligence& its applications

Course Code: V20AIT08

Course Outcomes (Along with Knowledge Level):

After Completing the course Student will be able to:

S.No.	CO No.	Course Outcome
1	C305 - E3	Discuss Problem Solving Agents and Environment. [K2]
2	C305 - E3	Identify Search Strategies for Non Deterministic and Unknown Environments. [K2]
3	C305 - E3	Illustrate Adversarial Search for Game Playing [K2]
4	C305 - E3	Discuss Reasoning approaches [K2]
5	C305 - E3	Illustrate Knowledge Representation approaches [K2]

TEXTBOOKS:

1. Artificial Intelligence: A Modern Approach, Stuart J. Russell and Peter Norvig, 3rd Edition, PrenticeHall.
2. Artificial Intelligence, Elaine Rich, Kevin Knight, Shivashankar B Nair, 3rd Edition, TataMcGraw-Hill.

REFERENCE BOOKS:

1. Artificial Intelligence, George F Luger, Pearson Education Publications.
2. Artificial Intelligence, SarojKaushik, 1st Edition, Cengage Learning.

Targeted Proficiency and Attainment Levels (for each course Outcome):

Cos		CO1	CO2	CO3	CO4	CO5
Targeted Proficiency Level		60	60	60	60	60
Targeted level of Attainment	Level 3	60	60	60	60	60
	Level 2	55	55	55	55	55
	Level 1	50	50	50	50	50

Lecture Plan:

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours required	Pedagogy	Teaching aids
1	CO 1	Dissemination of Department Vision, Mission, PEOs, POs, PSOs	-	1	-	
		Describe agents, environments	K2	1	Lecture	ICT
2		Discuss the concept of rationality	K2	1	Lecture With Discussion	ICT
3		Discuss the nature of environments	K2	1	Lecture With Discussion	ICT
4		Discuss the Structure of agents	K2	1	Lecture With Discussion	ICT
5		Discuss Problem solving agents	K2	1	Lecture With Discussion	ICT
6		Illustrate Example problems	K2	1	Lecture With Discussion	ICT
7		Illustrate Searching for solutions	K2	1	Lecture With Discussion	ICT
8		Explain Uniformed search strategies	K2	2	Lecture With Discussion	ICT
9		Explain Informed(Heuristic) search strategies	K2	2	Lecture With Discussion	ICT
10		Explain Heuristic functions	K2	1	Lecture With Discussion	ICT
				13		

S.No	Course Outcome	Intended Learning Outcomes(ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 2	Discuss Local search algorithms and optimization problems	K2	2	Lecture with Discussion	ICT
2		Explain Local Search in Continuous Spaces	K2	2	Lecture with Discussion	ICT
3		Illustrate Search with Non Deterministic Actions	K2	2	Lecture with Discussion	ICT
4		Illustrate Searching with Partial Observations	K2	2	Lecture with	ICT

					Discussion	
5		Describe Online Search Agents	K2	2	Lecture with Discussion	ICT
6		Illustrate Unknown Environments	K2	2	Lecture with Discussion	ICT
12						

S.No	Course Outcome	Intended Learning Outcomes(ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 3	Explain Games	K2	1	Lecture with Discussion	BB/ICT
2		Discuss Optimal decisions in games	K2	2	Lecture with Discussion	BB/ICT
3		Discuss Alpha-Beta pruning	K2	2	Lecture with Discussion	BB/ICT
4		Describe Imperfect real time decisions	K2	1	Lecture with Discussion	BB/ICT
5		Describe Stochastic games	K2	1	Lecture with Discussion	BB/ICT
6		Describe Partially observable games	K2	2	Lecture with Discussion	BB/ICT
7		Explain State of art Game programs	K2	2	Lecture with Discussion	BB/ICT
8		Discuss Alternative approaches	K2	1	Lecture with Discussion	BB/ICT
12						

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 4	Explain Propositional Logic	K2	1	Lecture with Discussion	BB/ICT
2		Discuss Propositional Theorem proving	K2	2	Lecture with Discussion	BB/ICT
3		Discuss Syntax and Semantics of First order logic	K2	1	Lecture with Discussion	BB/ICT
4		Explain first order logic	K2	2	Lecture with Discussion	BB/ICT

5		Describe Forward chaining	K2	2	Lecture with Discussion	BB/ICT
6		Describe Backward chaining	K2	2	Lecture with Discussion	BB/ICT
7		Discuss Resolution	K2	2	Lecture with Discussion	BB/ICT
12						

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 5	Explain Knowledge representation and mapping	K2	1	Lecture with Discussion	BB/ICT
2		Discuss the Approaches to knowledge representation	K2	2	Lecture with Discussion	BB/ICT
3		Describe Simple relational knowledge	K2	1	Lecture with Discussion	BB/ICT
4		Describe Inheritable knowledge	K2	2	Lecture with Discussion	BB/ICT
5		Describe Inferential knowledge	K2	2	Lecture with Discussion	BB/ICT
6		Describe Procedural knowledge	K2	1	Lecture with Discussion	BB/ICT
7		Discuss the Issues in knowledge representation	K2	1	Lecture with Discussion	BB/ICT
8		Explain the frame problem	K2	1	Lecture with Discussion	BB/ICT
11						

Total classes:60

Artificial Intelligence Lab

LESSON PLAN

After completion of this course, the students will be able to:

Academic Year: 2022-23

Programme: B.Tech

Year/ Semester: IV

Course Code: V20AIL08

Name of the Course: Artificial Intelligence Lab

After completion of this course, the students will be able to:

S.No.	CO No.	Course Outcome
1	C01	Demonstrate uninformed search techniques. [K3]
2	C02	Demonstrate heuristic search techniques [K3]
3	C03	Solve real world problems by searching. [K3]
4	C04	Develop AI agent for Gaming and AI-powered Chatbot (K3)

Text Books:

1. Artificial Intelligence : A Modern Approach, Stuart J. Russell and Peter Norvig, 3rd Edition, Prentice Hall.
2. Artificial Intelligence, Elaine Rich, Kevin Knight, Shivashankar B Nair, 3rd Edition, Tata McGraw-Hill.
3. Artificial Intelligence with Python, Alberto Artasanchez, Prateek Joshi, 2nd Edition, Packt Publishing

Targeted Proficiency and attainment Levels (for each Course Outcome):

Cos		CO1	CO2	CO3	CO4
Targeted Proficiency Level		70	70	70	70
Targeted level of Attainment	Level 3	75	75	75	75
	Level 2	70	70	70	70
	Level 1	65	65	65	65

Lab Plan:

Exp. No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO1	Solve Water Jug problem using BFS algorithm.	K3	06	Demonstration & Experiment	PPT
2		Solve Water Jug problem using DFS algorithm		03		

Exp. No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
3	CO2	Demonstrate Hill Climbing Algorithm	K3	06	Demonstration & Experiment	PPT
4		Demonstrate A* Algorithm		06		

Exp. No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
5	CO3	Solve the n-queens problem using backtracking.	K3	06	Demonstration & Experiment	PPT
6		Solve Travelling Salesman Problem using backtracking		06		

Exp. No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
7	CO4	Develop Tic-Tac-Toe game	K3	03	Demonstration & Experiment	PPT
8		Solve 8-Puzzle problem		06		
9		Develop a Simple Chatbot		06		

Total no of hours: 48

Operating Systems Lab

Academic Year: 2022-23

Programme: B.Tech.

Year/Sem: IV

Name of the Course: Operating Systems Lab

Course Code: V20AIL07

Course Outcomes (Along with Knowledge Level):

After Completing the course Student will be able to:

S.No.	CO No.	Course Outcome
1	C217.1	Illustrate CPU scheduling algorithms. (K3)
2	C217.2	Apply Bankers Algorithm for Deadlock Avoidance and Deadlock Detection (K3)
3	C217.3	Use Page replacement algorithms for memory management.(K3)

Targeted Proficiency and attainment Levels (for each Course Outcome):

Course Outcome	Targeted Proficiency Level (% of Marks)	Targeted level of Attainment (% Students)
CO1	60	65
CO2	60	65
CO3	60	65
CO4	60	65
CO5	60	65
CO6	60	65

LESSON PLAN

SN O	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours required	Pedagogy	Teaching aids
1	CO1	Simulate the following CPU scheduling algorithms: a) FCFS b) SJF c) Round Robin d) Priority	K3	3	Lecture with Experiment	Black Board
2		Implement : fork (), wait (), exec() and exit () system calls	K3	3	Lecture with Experiment	Black Board
3		Simulate Producer and Consumer problem using Semaphores	K3	3	Lecture with Discussion	Black Board

SN O	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours required	Pedagogy	Teaching aids
1	C02	Simulate Bankers Algorithm for Dead Lock Avoidance	K3	3	Lecture with Experiment	Black Board
2		Simulate Bankers Algorithm for Dead Lock Detection.	K3	3	Lecture with Experiment	Black Board

SN O	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours required	Pedagogy	Teaching aids
1	C03	Simulate the following page replacement algorithms: a) FIFO b) LRU c) LFU	K3	3	Lecture with Experiment	Black Board
2		Interpret Memory partition techniques a.)MFT b.)MVT	K3	3	Lecture with Experiment	Black Board
3		Simulate the following File allocation strategies: a) Sequenced b) Indexed c) Linked	K3	3	Lecture with Experiment	Black Board

Java Programming Lab

Academic Year: 2022-23

Programme: B.Tech.

Year/Sem: IV

Name of the Course: Java Programming Lab Course Code: V20AIL06/ C 218

Course Outcomes (Along with Knowledge Level):

After Completing the course Student will be able to:

S.No.	CO No.	Course Outcome
1	C218.1	Demonstrate Programs on Classes, Objects, Constructors and Arrays. [K3]
2	C218.2	Demonstrate Inheritance and Exception Handling. [K3]
3	C218.3	Implement programs on Multi-Threading and File Handling.. [K3]
4	C218.4	Implement Event handling using Swings.. [K3]

Text Books:

1. The complete Reference Java, 8th Edition, Herbert Schildt, TMH.
2. Introduction to java programming, Y Daniel Liang, 7 Edition, Pearson.

Targeted Proficiency and attainment Levels (for each Course Outcome):

Cos		CO1	CO2	CO3	CO4
Targeted Proficiency Level		65	65	65	65
Targeted level of Attainment	Level 3	65	65	65	60
	Level 2	55	55	55	50
	Level 1	45	45	45	40

Lecture Plan:

CO1:

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO1	Exp 1: Develop programs on Control Structures and Type Conversions in java.	K3	12	Demonstration & Experiment	PPT
2		Exp 2: Develop programs using various String handling functions				
3		Exp 3: Construct programs using the following concepts: a) Classes & Objects b) Usage of static c)Constructors				
4		Exp 4: Construct programs using the following concepts. a) Arrays b) Nested Classes c) Command Line Arguments				

CO2:

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
5	CO2	Exp 1: Construct programs using the following concepts. a) Inheritance b) Usage of super c) Method Overriding	K3	9	Lecture & Experiment	PPT
6		Exp 2: Construct programs using the following concepts. a) Usage of final b) Abstract class c) Interfaces				
7		Exp 3: Implement the programs using the concepts a) Packages b) Exception Handling.				

CO3:

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
8	CO3	Exp 1: Implement the programs on Multi-Threading. a) Multiple Threads on Single Object b) Thread Deadlock	K3	9	Demonstration & Experiment	PPT
9		Exp 2: Construct a program that shows Inter-thread Communication				
10		Exp 3: Construct programs to perform read and write operations on files. a) Sequential Files b) Random Access files				

CO4:

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
11	CO4	Exp 1: Develop GUI using Swings.	K3	6	Demonstration & Experiment	PPT
12		Exp 2: Construct programs on Event Handling using Listener Interfaces.				

Total no of hours: 36

Professional Communication Skills - II

Academic Year: 2022-23

Programme: B.Tech.

Year/Sem: IV

Course Code: V18ENT03/C220

Name of the Course: Professional Communication Skills - II

Course Outcomes (Along with Knowledge Level):

After Completing the course Student will be able to:

S.No.	CO No.	Course Outcome
1	C220.1	Recognize the easiest and best possible way of solving problem in the area of Number and Letter Series, Analogy, Classification, Coding & Decoding Symbols, Ranking and Analytical Reasoning.[K1]
2	C220.2	Investigate the different types of logics involved in Mirror and water Images, Logical Reasoning & Arithmetical Reasoning.[K4]
3	C220.3	Find the common traps in the questions and errors likely to be made from the concepts of Blood Relations, Directions, Average, Clock and Calendar, Data Sufficiency, Permutations-Combinations and Probability [K3]

Text Books:

- Work book-1 on Aptitude prepared by Training & Placement Cell, Sri Vasavi Engineering College.
- Magical Book on Quicker Maths-Tyra
- R.S.Agarwal-Sultan Chand Publications

Hyperlinks

1. <https://www.indiabix.com/>
2. <https://www.campusgate.co.in/>

Targeted Proficiency Level and Targeted level of Attainment (for each Course Outcome):

Course Outcome	Targeted Proficiency Level (% of Marks)	Targeted level of Attainment (% Students)
3	50	60
4	50	60
5	50	60

CO 3

S. No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 3	Students can Identify the Next letter or Number in a correct Relation.	K1	1	Lecture	PPT/A.V
2		Students can justify the relation between words and Numbers.	K1	1	Lecture	PPT/A.V
3		Students can identifying different one from group of terms.	K1	1	Lecture	PPT/A.V
4		Students can Describe their Rank in a class or in a Compitation.	K1	1	Lecture	PPT/A.V

CO 4

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 4	Can Classify the ages in a family members/ Explain the relation between numbers.	K4	1	Lecture	PPT/A.V
2		Calculate the Actual time in Mirror and Water/ Classify the Images.	K4	1	Lecture	PPT/A.V
3		Differentiate the logic behind the conclusions.	K4	1	Lecture	PPT/A.V
4		Students can Explain the logic for given problem.	K4	1	Lecture	PPT/A.V

CO 5

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 5	Students can choose the correct relation between the persons.	K3	1	Lecture	PPT/A.V
2		Students can show the correct direction.	K1	1	Lecture	PPT/A.V
3		Students can calculate the Average of data.	K1	1	Lecture	PPT/A.V
4		Students can Relate the correct day for given date and angle between two hands of a clock.	K1	2	Lecture	PPT/A.V
5		Students can Intercept data.	K1	1	Lecture	PPT/A.V
6		Students can report the Real Time Scenarios possibility..	K1	2	Lecture	PPT/A.V

Total No. of Classes:16