

Academic Year
2021-22

III SEM CSE

Handbook

(V20 Regulation)

INDEX

S.NO	CONTENTS	PAGE NO.
1.	Institute Vision & Mission	3
2.	Department Vision & Mission	5
3.	Program Educational Objectives, Program Outcomes & Program Specific Outcomes	7
4.	Academic Calendar	10
5.	Class Time Table	11
6.	Course Structure	13
7.	Managerial Economics and Financial Analysis(MEFA) (Lesson Plan)	15
8.	Mathematical Foundation Of Computer Science(MFCS) (Lesson Plan)	20
9.	OOPs Through C++(OOPS) (Lesson Plan)	24
10.	Data Structures(DS) (Lesson Plan)	28
11.	Computer Organization and Architecture(COA) (Lesson Plan)	33
12.	OOPs Through C++ Lab(OOPs Lab) (Lesson Plan)	37
13.	Data Structures Lab(DS Lab) (Lesson Plan)	39
14.	Linux Shell Scripting Lab(LSS Lab) (Lesson Plan)	42
15.	Professional Communication Skills -I(PCS-I) (Lesson Plan)	46

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..

DEPARTMENT

VISION
MISSION

DEPARTMENT

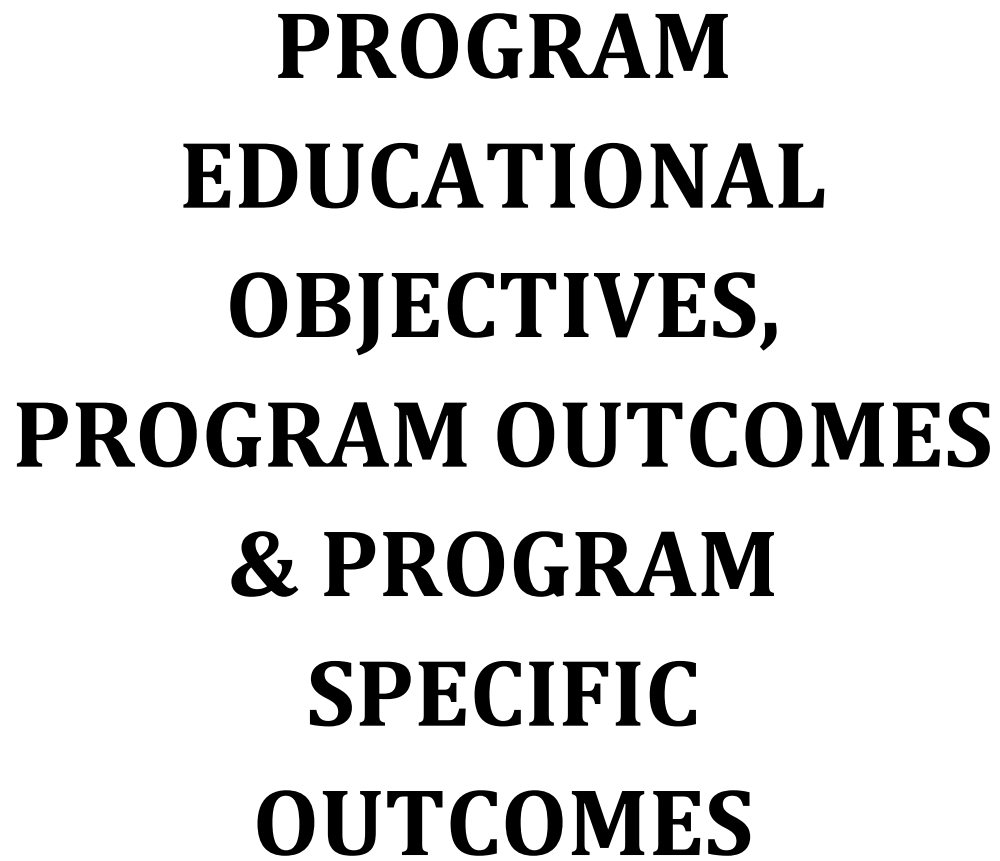
VISION AND MISSION

Vision:

- To evolve as a centre of academic and research excellence in the area of Computer Science and Engineering.

Mission :

- To utilize innovative learning methods for academic improvement.
- To encourage higher studies and research to meet the futuristic requirements of Computer Science and Engineering.
- To inculcate Ethics and Human values for developing students with good character



**PROGRAM
EDUCATIONAL
OBJECTIVES,
PROGRAM OUTCOMES
& PROGRAM
SPECIFIC
OUTCOMES**

Program Educational Objectives (PEOs)

Graduates of this programme will :

PEO 1: Adapt to evolving technology.

PEO 2: Provide optimal solutions to real time problems.

PEO 3: Demonstrate his/her abilities to support service activities with due consideration for Professional and Ethical Values.

Programme Specific Outcomes (PSO s):

A graduate of the Computer Science and Engineering Program will be able to:

PSO 1: Use Mathematical Abstractions and Algorithmic Design along with Open Source Programming tools to solve complexities involved in Programming. [K3]

PSO 2: Use Professional engineering practices and strategies for development and maintenance of software. [K3]

Program Outcomes (POs):

Computer Science Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of Mathematics, Science, Engineering Fundamentals and Concepts of Computer Science Engineering to the solution of complex Engineering problems. **[K3]**
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of Mathematics, Natural Sciences and Computer Science. **[K4]**
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specific needs with appropriate consideration for the public health and safety, and the cultural, societal and environmental considerations. **[K5]**
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. **[K5]**
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex Engineering activities with an understanding of the limitations. **[K3]**
6. **The Engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional Engineering practice. **[K3]**
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. **[K3]**
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the Engineering practice. **[K3]**
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. **[K6]**
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. **[K2]**
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. **[K6]**
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. **[K1]**

ACADEMIC CALENDAR

✉ : principal@srivasaviengg.ac.in
svec.a9@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: 18-10-2021

Revised Academic Calendar For B.Tech III ,V and VII semesters, Academic Year 2021-22

(As per G.O. Rt.No. 242, Higher Education (U.F) Dept., dated 13/09/2021)

III, V and VII Semesters			
Description	From	To	Weeks
Commencement of Class Work	01.10.2021		
I Unit of Instructions	01.10.2021	20.11.2021	7 W
I Mid Examinations	22.11.2021	27.11.2021	1 W
II Unit of Instructions	29.11.2021	15.01.2022	7 W
II Mid Examinations	17.01.2022	22.01.2022	1 W
Preparation & Practicals	24.01.2022	29.01.2022	1 W
End Examinations	31.01.2022	12.02.2022	2 W
Commencement of Next Semester Class Work	14.02.2022		
IV,VI and VIII Semesters			
I Unit of Instructions	14.02.2022	02.04.2022	7 W
I Mid Examinations	04.04.2022	09.04.2022	1 W
II Unit of Instructions	11.04.2022	28.05.2022	7 W
II Mid Examinations	30.05.2022	04.06.2022	1 W
Preparation & Practicals	06.06.2022	11.06.2022	1 W
End Examinations	13.06.2022	25.06.2022	2 W
Commencement of Next Year Class Work			
Note : Calendar is prepared with 8 hrs/day hence 7 weeks per instruction period. Internal Examinations shall be conducted during the instructional days.			


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 Computer Science & Engineering (Accredited by NBA)



CLASS CONSOLIDATED TIME TABLE

Class: III SEM Section – A Class Coordinator: Mr.P.UmaSankar Room:301 W.E.F. :01-11-2021

Periods	1	2	3	4	1:00P M 2:00P M	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	OOP	COA	PCS-I	PCS-I	LUNCH BREAK	MEFA	DS	MFCS
Tue	DS	MFCS	COA	MEFA		DS LAB		
Wed	COA	DS	OOP	MEFA		LSS LAB		
Thu	MEFA	OOP	MFCS	LIBRARY		DS	OOP	COA
Fri	MFCS	OOP LAB				DS	PCS-I	OOP
Sat	LSS	DS	MFCS	MEFA		COA	OOP	SPORTS

Class: III SEM Section – B Class Coordinator: Mrs.A.NagaJyothi Room:302 W.E.F. :01-11-2021

Periods	1	2	3	4	1:00P M 2:00P M	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	DS	DS LAB			LUNCH BREAK	OOP	COA	MEFA
Tue	OOP	OOP LAB				MFCS	MEFA	SPORTS
Wed	MEFA	MFCS	LSS	DS		MFCS	OOP	DS
Thu	COA	DS	MEFA	OOP		LSS LAB		
Fri	PCS-I	COA	DS	LIBRARY		MEFA	COA	MFCS
Sat	MFCS	OOP	COA	OOP		DS	PCS-I	PCS-I

Class: III SEM Section – C Class Coordinator: Mr.P.Rajesh Room:303 W.E.F. :01-11-2021

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	MEFA	DS	MFCS	COA	LUNCH BREAK	OOP	DS	OOP
Tue	OOP	LSS LAB				DS	MFCS	COA
Wed	MFCS	DS	DS	LIBRARY		OOP	COA	MEFA
Thu	LSS	OOP	COA	MEFA		MFCS	MFCS	PCS-I
Fri	DS	DS LAB				PCS-I	PCS-I	MFCS
Sat	COA	OOP LAB				MEFA	OOP	SPORTS

Class: III SEM Section – D Class Coordinator: Mr.Ch.Hemanand Room:304 W.E.F. :01-11-2021

Periods	1	2	3	4	1:00P M 2:00P M	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	LSS	COA	OOP	DS	LUNCH BREAK	LIBRARY	MFCS	MEFA
Tue	MFCS	PCS-1	DS	MEFA		COA	OOP	DS
Wed	OOP	OOP LAB				MEFA	DS	SPORTS
Thu	DS	DS LAB				OOP	COA	MEFA
Fri	MEFA	MFCS	COA	OOP		MFCS	OOP	DS
Sat	PCS-1	PCS-1	COA	MFCS		LSS LAB		

Staff Details:

S. No.	Course Code	Course Name	A	B	C	D
1.	V20MBT51	Managerial Economics and Financial Analysis(MEFA)	Dr.K.Ramba bu	Dr.K.Ramba bu	Mrs.B.Arun a	Mrs.B.Aruna
2.	V20MAT07	Mathematical Foundation Of Computer Science(MFCS)	Dr. V S Naresh	Dr. V S Naresh	Mrs. N Hiranmayee	Mrs. N Hiranmayee
3.	V20CST03	OOPs Through C++(OOPS)	Mr.K.Laksh miNarayana	Mr.K.Laksh miNarayana	Mr. Ch.Hemana nd	Mr. Ch.Hemana nd
4.	V20CST04	Data Structures(DS)	Mr.P Uma Sankar	Mr.P Uma Sankar	Mr. P. Rajesh	Mr. P. Rajesh
5.	V20CST05	Computer Organization and Architecture(COA)	Mrs.A Naga Jyothi	Mrs.A Naga Jyothi	Mrs.A Naga Jyothi	Mr.K.Harikr ishna
6.	V20CSL03	OOPs Through C++ Lab(OOPs Lab)	Mr.K.Laksh mi Narayana / Mrs.Y.Divya vani	Mr.K.Laksh mi Narayana/ Mr.Sheik Shabuddin	Mr. Ch.Hemana nd/ Mr.G.Srira m Ganesh	Mr. Ch.Hemana nd/ Mrs.A.Naga Jyothi
7.	V20CSL04	Data Structures Lab(DS Lab)	Mr.P Uma Sankar/ Mr.S.Kumar Reddy Mallidi	Mr.P Uma Sankar/ Mr.S.Kumar Reddy Mallidi	Mr. P. Rajesh/ Mrs.G. Nagavallika	Mr. P. Rajesh/ Mr.Sheik Shabuddin
8.	V20CSL05	Linux Shell Scripting Lab(LSS Lab)	Mrs. G Naga vallika/ Mr.J.N.Cha ndraSekhar	Mrs. G Naga vallika/ Mrs.G.Prasa ntha	Mrs. G Naga vallika/ Mrs.P.Sunee tha	Mrs. G Naga vallika/ Mrs.G.Prasa ntha
9.	V20ENT02	Professional Communication Skills –I(PCS-I)	Dr.T.Sujani/ Mrs .K. RadhaMadh avi	Mr.T V SSuresh/ Mr.G. Srinivasrao	Mr. K V Ramarao/ Mr.M.Venk ata Ramana	Mr.T V S Suresh/ Dr. T Sujani



Head of the Department

COURSE STRUCTURE

III-Semester

B.TECH Course Structure

S.No.	Code	Name of the Course		L	T	P	C
1	V20MBT51	Managerial Economics and Financial Analysis	HSS	3	-	-	3
2	V20MAT07	Mathematical Foundation Of Computer Science	ESC	3	-	-	3
3	V20CST03	OOPs Through C++	PCC	3	-	-	3
4	V20CST04	Data Structures	PCC	3	-	-	3
5	V20CST05	Computer Organization and Architecture	ESC	3	-	-	3
6	V20CSL03	OOPs Through C++ Lab	PCC	-	-	3	1.5
7	V20CSL04	Data Structures Lab	PCC	-	-	3	1.5
8	V20CSL05	Linux Shell Scripting Lab	PCC	-	-	3	1.5
9		Skill Oriented Courses (See Annexure-I)	SO	1	0	2	2
Total:				18	0	11	21.5
10	V20ENT02	Professional Communication Skills -I	MNC	2	-	-	0



**LESSON
PLANS**

Managerial Economics and Financial Analysis

Academic Year: 2021-22

Programme: B.Tech

Semester: III

Section: A,B,C& D

Name of the Course: Managerial Economics and Financial Analysis

Course Code: V20MBT51

LESSON PLAN

COURSE OUTCOMES (Along with Knowledge Level):

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

- CO1.** Understand the basic concepts of managerial Economics, Demand and Elasticity of demand and Methods of Demand Forecasting. (K2)
- CO2.** Interpret Production concept, Least cost combinations and various costs concepts in Decision making (K3)
- CO3.** Differentiate various Markets and Pricing Methods along with Business Cycles (K2)
- CO4.** Prepare Financial Statements and its Analysis (K3)
- CO5.** Assess various Investment Project Proposals with the help of Capital Budgeting Techniques for Decision making (K3)

TEXT BOOKS:

1. Aryasri: Managerial Economics and Financial Analysis, 2/e, TMH, 2005.2.
2. Varshney & Maheswari: Managerial Economics, Sultan Chand,2003.
3. S A Siddhiqui &AS Siddhiqui, Managerial Economics and Financial Analysis, New Age international publishers2013.

REFERENCE BOOKS:

1. **Dr.B.Kuberudu and Dr.T.V.Ramana:** Managerial Economics and Financial Analysis Himalaya Publishing House, 2014.
2. V.Maheswari: Managerial Economics, Sultan chand.2014.
3. Suma Damodaran: Managerial Economics, Oxford, 2011.
4. S.A.Siddiqui: Managerial Economics Financial Analysis, New Age International Publishers, 2012.

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

Course Outcome	Targeted Proficiency Level (% of Marks)	Targeted level of Attainment (% Students)
1	60	60
2	60	60
3	60	60
4	60	60
5	60	60

CO 1

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
	CO 1 K2	UNIT–Introduction to managerial economics and Demand Analysis				
1		Definition of Managerial Economics	K1	1	LECTURE	ICT
2		Scope-Managerial Economics	K1	1	LECTURE	ICT
3		ME and its relation with other subjects	K2	1	LECTURE	ICT
4		Concept of Demand	K1	1	LECTURE	ICT
5		Types-Determinants of Demand	K2	3	LECTURE	ICT
6		Law of Demand its Exceptions	K2	1	LECTURE	ICT
7		Elasticity of Demand	K2	1	LECTURE	ICT
8		Types and Measurement	K2	1	LECTURE	ICT
9		Demand forecasting and its Measuring Methods.	K2	1	LECTURE	ICT
		TOTAL		9		

CO 2

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
	CO 2 K3	UNIT–II: Production analysis and cost analysis				
1		Production function	K1	1	LECTURE	ICT
2		Iso-quants and Iso-cost	K3	1	LECTURE	ICT
3		Law of Variable proportions	K3	1	Discussion	ICT
4		Cobb-Douglas Production function	K3	2	Discussion	ICT
5		Economies of Scale	K3	1	LECTURE	ICT
6		Cost Concepts	K3	1	LECTURE	ICT
7		Opportunity Cost-Fixed vs Variable Costs-Explicit Costs vs Implicit Costs	K3	1	LECTURE	ICT
8		Cost Volume Profit analysis	K3	1	LECTURE	ICT
9	Determination of Break-Even Point-BEP Chart (Simple Problems).	K3	1	LECTURE	ICT	
		TOTAL		10		

CO 3

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
	CO 3 K2	UNIT–III: Introduction To Markets, Pricing Policies & forms of Organizations and Business Cycles				
1		Market Structures	K2	2	LECTURE	ICT
2		Perfect Competition	K2	2	LECTURE	ICT
3		Monopoly, Monopolistic and Oligopoly	K2	3	Discussion with Lecture	ICT
4		Features – Price, Out-put Determination of Perfect and Imperfect markets	K2	2	LECTURE	ICT
5		Methods of Pricing	K2	1	LECTURE	ICT
6		Evolution of Business Forms	K2	1	LECTURE	ICT

7		Features of Sole Trader	K2	1	LECTURE	ICT
8		Partnership – Joint Stock Company	K2	1	LECTURE	ICT
9		State/Public Enterprises	K2	1	LECTURE	ICT
10		Business Cycles – Meaning and Features	K2	1	LECTURE	ICT
11		Phases of Business Cycle	K2	1	LECTURE	ICT
		TOTAL		16		

CO 4

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
		UNIT–IV: Introduction to Accounting & Financing Analysis				
1	CO 4 K3	Introduction to Double Entry System	K3	4	LECTURE	ICT
2		Preparation of Financial Statements	K3	2	Lecture with Discussion	ICT
3		Trading Account	K3	1	LECTURE	ICT
4		Profit & Loss Account	K3	1	Discussion	ICT
5		Balance Sheet	K3	1	LECTURE	ICT
6		Ratio Analysis – (Simple Problems).	K3	1	LECTURE	ICT
		TOTAL		10		

CO 5

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
		Unit–V: Capital and Capital Budgeting				
1	CO 5 K3	Capital Budgeting: Meaning of Capital	K3	2	LECTURE	ICT
2		Capitalization	K3	2	LECTURE	ICT
3		Meaning of Capital Budgeting	K3	4	LECTURE	ICT

4		Need for Capital Budgeting	K3	4	LECTURE	ICT
5		Techniques of Capital Budgeting	K3	2	LECTURE	ICT
		Traditional and Modern Methods.	K3	3	LECTURE	ICT
		TOTAL		17		

Total No. of Classes: 62

Mathematical Foundation Of Computer Science(MFCS)

Academic Year: 2021-22

Programme: B.Tech

Year/ Semester: III Sem

Section: A,B,C& D

Name of the Course: Mathematical Foundation Of Computer Science

Course Code: V20MAT07

LESSON PLAN

Course Outcomes (Along with Knowledge Level):

After completion of this course, Student will be able to:

COX	Course Outcomes	KX
V20MAT07.1	Demonstrate the concepts associated with propositions and mathematical logic	K3
V20MAT07.2	Demonstrate the basic concepts associated with relations, functions and their applications	K3
V20MAT07.3	Solve recurrence relations using various methods	K3
V20MAT07.4	Apply techniques of graphs for real-time problems	K3
V20MAT07.5	Construct minimal spanning tree by using different algorithms	K3

TEXT BOOKS:

1. Discrete Mathematical Structures with Applications to Computer Science, J. P. Tremblay and P. Manohar, 1st Edition, Tata McGraw Hill.
2. Discrete Mathematics and its Applications with Combinatorics and Graph Theory, K. H. Rosen, 7th Edition, Tata McGraw Hill.
3. Discrete Mathematics for Computer Scientists and Mathematicians, J. L. Mott, A. Kandel, T.P. Baker, 2nd Edition, Prentice Hall of India.

REFERENCE BOOKS:

1. Elements of Discrete Mathematics -A Computer Oriented Approach, C. L. Liu and D. P. Mohapatra, 3rd Edition, Tata McGraw Hill.
2. Discrete Mathematics with Combinatorics and Graph Theory, Santha, 1st Edition Cengage Learning.

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

Cos		C01	C02	C03	C04	C05
Targeted Proficiency Level		60	60	60	60	60
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:

UNIT-1

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours Required	Pedagogy	Teaching aids
1	CO1	Dissemination of Vision, Mission, PEOs,POs,PSOs		1	Lecture	ICT
2		Mathematical Logic: Define Statements and their Notations, Connectives	K1	1	Lecture	BB
3		Describe Well Formed Formulas, Truth Tables, Tautologies	K2	1	Lecture with Discussion	BB
4		Explain equivalence of Formulas	K2	2	Lecture	BB
5		State duality Law, Tautological implications	K1	1	Lecture with Discussion	BB
6		Convert to normal forms	K2	2	Lecture	BB
7		Illustrate theory of inference for statement calculus, consistency of premises,	K3	2	Lecture	BB
8		Practice indirect method of proof	K3	2	Lecture	BB
9		Identify statement functions, variables and quantifiers, free and bound Variables	K2	1	Lecture	BB
10		Recognize theory for predicate calculus- Predicates, quantifiers, universe of discourse	K2	2	Lecture	ICT
11		Total		15		

UNIT-2

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours Required	Pedagogy	Teaching aids
1	CO 2	Set Theory and Relations: Define basic concepts	K1	1	Lecture	ICT
2		Illustrate operations on binary sets	K2	1	Lecture	ICT
3		Use principle of inclusion and exclusion	K3	1	Lecture	ICT
4		Describe Relation and properties of binary relations on a set and Transitive Closure	K2	1	Lecture	BB
5		Sketch out relation matrix and digraph	K3	1	Lecture with	BB

					Discussion	
6		Practice equivalence, and partial ordering relations	K3	2	Lecture with Discussion	BB
7		Construct hasse diagrams, lattice and state its properties.	K3	2	Lecture	BB
8		Illustrate Functions, bijective functions, composition of functions	K3	1	Lecture	BB
9		Total		10		

UNIT-3

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours Required	Pedagogy	Teaching aids
1	CO 3	Recurrence Relations Explain Generating of functions	K2	2	Lecture	ICT
2		Calculate Coefficient of generating functions	K3	2	Lecture	BB
3		Explain Recurrence relations	K1	1	Lecture with discussion	BB
4		Solve homogeneous Recurrence relations by method of substitution	K3	1	Lecture	ICT
5		Solve homogeneous Recurrence relations by Generating functions	K3	2	Lecture with discussion	BB
6		Solve Recurrence relations by method of characteristic roots	K3	2	Lecture with discussion	BB
7		Solve inhomogeneous recurrence relations	K3	3	Lecture	BB
8		Total		13		

UNIT-4

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours Required	Pedagogy	Teaching aids
1	CO 4	Describe basic concepts of graphs	K1	2	Lecture with Discussion	ICT
2		Illustrate matrix representation of graphs, Adjacency matrices, Incidence matrices	K2	1	Lecture	BB
3		Predict subgraph, isomorphic graphs, paths and circuits	K3	2	Lecture	ICT
4		Demonstrate Eulerian and Hamiltonian Graphs, Multigraphs	K3	2	Lecture with Discussion	BB
5		Use Euler's Formula for Planar Graphs	K3	1	Lecture with Discussion	BB
6		Explain Graph Colouring and Chromatic Number	K2	1	Lecture with Discussion	BB
7		Total		9		

UNIT-5

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours Required	Pedagogy	Teaching aids
1	CO 5	Explain tree and spanning trees	K2	2	Lecture	BB
2		Sketch Minimal spanning trees using Kruskal's algorithms	K3	2	Lecture	BB
3		Sketch Minimal spanning trees using Prim's algorithms	K3	2	Lecture	BB
4		Construct BFS	K3	2	Lecture	BB
5		Construct DFS	K3	2	Lecture	BB
6		Explain binary trees	K2	2	Lecture	BB
		Explain Planar Graphs	K2	1	Lecture	BB
9		Total			13	

Total No. of Classes: 60

OOPs through C++

Academic Year: 2021-22

Semester: III

Name of the Course: OOPs through C++

Programme: B.Tech

Section: A,B,C& D

Course Code: V20CST03

LESSON PLAN

COURSE OUTCOMES (Along with Knowledge Level):

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

S.No.	CO No.	Course Outcome	BTL
1.	C01	Differentiate Procedural Oriented Programming and Object-Oriented Programming.	K2
2.	C02	Develop Object Oriented Program by using Classes and Objects	K3
3.	C03	Demonstrate various object-oriented concepts like Constructors, destructors & Operator-Overloading	K3
4.	C04	Apply various Object-Oriented features like inheritance and polymorphism to solve various computing Problems.	K3
5.	C05	Develop programs to handle Exceptions & Files and also using Generic Programming	K3

Text Books:

1. Programming in C++, Ashok N Kamthane, 2nd Edition, Pearson.
2. C++ How to Program, Paul J. Deitel, Harvey Deitel, 6th edition, PHI publication.

Reference Books:

1. Object Oriented Programming C++, Joyce Farrell, Cengage.
2. Mastering C++, Venugopal, Raj Kumar, Ravi Kumar, TMH.
3. The Complete Reference C++, Herbert Schildt, 4th Edition, Mcgraw Hill.
4. Object Oriented Programming With C++, R. Subburaj, Vikas Publishing House.

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	Pedagogy	Teaching aids
1	CO1	Define Object-Oriented Programming	K1	1	Lecture	BB/ICT
2		Describe about Data Types, Variables, Constants, Operators.	K2	1	Lecture	BB/ICT
3		Explain decision Statements & Control Structures with examples	K2	1	Lecture	BB/ICT
4		Discuss about Arrays, Namespace, Default Arguments, Constant Arguments	K2	1	Lecture	BB/ICT
5		Discuss Parameter Passing Techniques	K2	2	Lecture	BB/ICT
6		Explain about Features of Object Oriented Programming	K2	1	Lecture+ Discussion	BB/ICT
7		Demonstrate the example programs using arrays.	K2	2	Lecture	BB/ICT

1	CO2	Define class and object with examples	K1	2	Lecture	BB/ICT
2		Explain about Access specifiers, Scope Resolution Operator, Static Member variables	K2	1	Lecture	BB/ICT
3		Describe about Static Member Functions, Array of Objects with examples	K3	2	Lecture+ Discussion	BB/ICT
4		Illustrate Inline Functions, Overloading Member Functions with example programs.	K3	1	Lecture	BB/ICT
5		Explain about Objects as Function Arguments with examples.	K2	1	Lecture	BB/ICT
6		Explain about Friend Functions, Friend Class with an example program.	K2	1	Lecture	BB/ICT
7		Construct Local Class, Empty Class with an example program.	K3	2	Lecture+ Discussion	BB/ICT
8		Construct Nested Classes with an example program and explain.	K3	1	Lecture	BB/ICT
9		Prepare a program using the concept Return by Reference	K3	1	Lecture	BB/ICT

1	CO3	Define Constructor	K1	1	Lecture	BB/ICT
---	-----	--------------------	----	---	---------	--------

2		Explain the characteristics of a constructor.	K2	1	Lecture	BB/ICT
3		Demonstrate about Constructor with default arguments, Parameterized constructors,	K3	2	Lecture	BB/ICT
4		Illustrate about Overloading constructors with an example.	K3	1	Lecture	BB/ICT
5		Construct Dynamic Constructors and Destructors	K3	1	Lecture	BB/ICT
6		Explain about Anonymous Objects.	K2	1	Lecture	BB/ICT
7		Explain Operator overloading and its rules with an example.	K2	1	Lecture	BB/ICT
8		Demonstrate unary and binary operators	K3	2	Lecture+ Discussion	BB/ICT
9		Demonstrate about this keyword, Constraint on Increment and Decrement Operators	K3	1	Lecture	BB/ICT
10		Illustrate Overloading with Friend Functions with an example	K3	1	Lecture	BB/ICT
11		Explain about Type Conversions	K2	1	Lecture	BB/ICT

1		Define inheritance	K1	1	Lecture	BB/ICT
2	CO4	Explain about types of inheritances(Single Inheritance, Multiple Inheritance, Multilevel Inheritance, Hierarchical Inheritance, Hybrid Inheritance)	K2	1	Lecture	BB/ICT
3		Illustrate example programs on Single Inheritance, Multiple Inheritance, Multilevel Inheritance, Hierarchical Inheritance, Hybrid Inheritance	K3	3	Lecture	BB/ICT
4		Demonstrate Virtual Base Classes with example programs.	K3	2	Lecture	BB/ICT
5		Demonstrate about Constructor in Derived Classes. qualifier classes and inheritance.	K2	2	Lecture	BB/ICT
6		Explain about Early Vs Late Binding, Pure Virtual Functions, Virtual Destructor		1	Lecture	BB/ICT
7			Define Exception handling	K1	1	Lecture
8		Explain about the keywords in exception handling with an example	K2	1	Lecture	BB/ICT
9		Demonstrate Multiple Catch Statements.	K3	1	Lecture	BB/ICT

10		Illustrate about Catching Multiple Exceptions with an example.	K3	1	Lecture	BB/ICT
11		Explain about Re-throwing Exception	K2	1	Lecture	BB/ICT

1	CO 5	Define file and file mode parameters.	K1	1	Lecture	BB/ICT
2		Explain about File Opening Modes, File Stream Classes, I/O manipulators	K2	1	Lecture	BB/ICT
3		Describe about Classes for File Handling	K2	1	Lecture	BB/ICT
4		Explain Sequential Access Files, Random Access Files with suitable examples.	K2	1	Lecture	BB/ICT
5		Explain about Error Handling Functions	K2	1	Lecture	BB/ICT
6		Define Template, Class Template and Function Template.	K1	2	Lecture	BB/ICT
7		Demonstrate about Class Templates and function Templates.	K3	1	Lecture	BB/ICT
8		Explain about Standard Template Library.	K2	2	Lecture	BB/ICT
9		Explain about Sequential Containers & Associative Containers.	K2	2	Lecture	BB/ICT

Data Structures

Academic Year: 2021-22
Semester: III
Name of the Course: Data Structures

Programme: B.Tech
Section: A,B,C& D
Course Code: V20CST04

LESSON PLAN

Course Outcomes (Along with Knowledge Level):

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

S.No.	CO No.	Course Outcome	BTL
1.	CO1	Illustrate the time and space complexities for Searching and Sorting Algorithms	K2
2.	CO2	Demonstrate Linked list and their Operations	K3
3.	CO3	Demonstrate Stacks and Queues	K3
4.	CO4	Illustrate Basic Operations on Binary Trees	K3
5.	CO5	Demonstrate Graph and their applications	K3

Text Books:

1. Data Structures, algorithms and applications in C, SartajSahni, Universities press, Second Edition.
2. Fundamentals of Data Structures in C, Ellis Horowitz, SartajSahni and Dinesh Mehta, 2nd Edition, Universities Press (India) Pvt. Ltd

Reference Books:

1. An Introduction to Data Structures with Application, Jean-Paul Tremblay , Paul Sorenson, Second Edition.
2. Fundamentals of Data Structures and algorithms by C V Sastry, RakeshNayak, Ch. Raja Ramesh, IK Publications, new Delhi.
3. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.

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

Cos		CO1	CO2	CO3	CO4	CO5
Targeted Proficiency Level		70	65	65	60	60
Targeted level of Attainment	Level 3	75	65	65	65	65
	Level 2	70	60	60	60	60
	Level 1	65	60	60	60	60

Lecture Plan

CO 1

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 1	Dissemination of Vision, Mission of the Dept.and PEOs,PO's & PSOs of the Programme		1	Lecture	BB+ICT
2		Define Data Structure, Algorithm Explanation of Data Structure types	K1	1	Lecture	BB+ICT
3		Explain Performance Analysis: Space complexity and Time complexity	K2	1	Lecture with Discussion	BB+ICT
4		Illustrate Asymptotic Notations: Big oh, Big Omega, Big Theta notations	K2	2	Lecture with Discussion	BB+ICT
5		Explain Linear Search, Binary Search and Fibonacci Search	K2	2	Lecture with Discussion	BB+ICT
6		Explain Bubble Sort Algorithm	K2	1	Lecture with Discussion	BB+ICT
7		Explain Selection Sort Algorithm	K2	1	Lecture with Discussion	BB+ICT
8		Illustrate Insertion Sort Algorithm	K2	1	Lecture with Discussion	BB+ICT
9		Explain Radix Sort Algorithm	K2	1	Lecture with Discussion	BB+ICT
10		Illustrate Quick Sort Algorithm	K2	1	Lecture with Discussion	BB+ICT
11		Explain Merge Sort Algorithm	K2	1	Lecture with Discussion	BB+ICT

CO 2

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO2	Define Node and Self Referential structure	K1	1	Lecture with Discussion	BB+ICT
2		Explain operations on Single Linked List	K2	3	Lecture with Discussion	BB+ICT
3		Illustrate operations like insert delete and display in Double linked list	K2	3	Lecture with Discussion in class	BB+ICT
4		Demonstrate Circular linked list operations	K3	3	Lecture with Discussion in class	BB+ICT

CO 3

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO3	Define Stack, Stack ADT	K1	1	Lecture	BB+ICT
2		Explain array representation of Stack	K2	2	Lecture with Discussion	BB+ICT
3		Explain linked list representation of Stack	K2	2	Lecture with Discussion	BB+ICT
4		Solve Towers of Hanoi problem	K2	1	Lecture with Discussion	BB+ICT
5		Explain infix to postfix conversion	K2	2	Lecture with Discussion	BB+ICT
6		Discuss Expression Evaluation	K2	1	Lecture with Discussion	BB+ICT
7		Define Queue, Queue ADT	K1	1	Lecture with Discussion	BB+ICT
8		Explain array representation of Queue	K2	2	Lecture with Discussion	BB+ICT
9		Explain Linked List representation of Queue	K2	2	Lecture with Discussion	BB+ICT
10		Discuss Applications of Queue	K2	1	Lecture with Discussion	BB+ICT

11		Demonstrate Circular Queue operations	K3	2	Lecture	BB+ICT
----	--	---------------------------------------	----	---	---------	--------

CO 4

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO4	Define Trees, terminology of Trees	K1	1	Lecture	BB+ICT
2		Illustrate representation of Trees	K2	1	Lecture	BB+ICT
3		Define Binary Tree and Binary Tree ADT	K1	1	Lecture	BB+ICT
4		Explain Properties and Representations of binary Trees	K2	2	Lecture with Discussion	BB+ICT
5		Demonstrate Tree Traversals techniques– In order, Pre Order, Post order	K3	2	Lecture with Discussion	BB+ICT
6		Demonstrate Binary Search Tree and its properties	K3	1	Lecture	BB+ICT
7		Apply operations of Binary Search Tree: BST	K3	3	Lecture	BB+ICT

CO 5

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 5	Define Graphs and Graph Representation and its properties and types	K1	2	Lecture with Discussion	BB+ICT
2		Explain Graph Operations	K2	1	Lecture with Discussion	BB+ICT
3		Demonstrate Graph Traversal techniques: Depth First Search	K3	1	Lecture with Discussion	BB+ICT
4		Demonstrate Graph Traversal techniques: Breadth First Search	K3	1	Lecture with Discussion	BB+ICT
5		Define Spanning Trees and minimum cost spanning trees	K1	1	Lecture with Discussion	BB+ICT
6		Demonstrate Prim's Algorithm	K3	1	Lecture with Discussion	BB+ICT
7		Demonstrate Kruskal's Algorithm	K3	1	Lecture with Discussion	BB+ICT
8		Solve Single Source Shortest Path Problem	K3	1	Lecture with Discussion	BB+ICT
9		Solve All Pairs Shortest Path Problem	K3	1	Lecture with Discussion	BB+ICT

Total No. of Classes: 61

Computer Organization and Architecture

Academic Year: 2021-22

Programme: B.Tech

Semester: III

Section: A,B,C& D

Name of the Course: Computer Organization and Architecture

Course Code: V20CST05

LESSON PLAN

Course Outcomes (Along with Knowledge Level):

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

S.No.	CO No.	Course Outcome	BTL
1.	CO1	Illustrate Basic structure of Computers, Instruction types and their addressing modes	K2
2.	CO2	Describe the different modes of Input / Output transfer.	K2
3.	CO3	Illustrate different types of Memory.	K2
4.	CO4	Describe the different types of Control Unit techniques	K2
5.	CO5	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

OOPs through C++ Lab

Academic Year: 2021-22

Year/ Semester: III

Name of the Course: OOPs through C++ Lab

Programme: B.Tech

Section: A,B,C& D

Course Code: V20CSL03

LESSON PLAN

COURSE OUTCOMES (Along with Knowledge Level):

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

CO1	Develop programs to understand control statements [K3]
CO2	Develop programs on Classes and Objects.[K3]
CO3	Demonstrate Constructors, Destructors and Operator-Overloading, Inheritance and Polymorphism.[K3]
CO4	Develop programs to handle Exceptions & Files. [K3]
CO5	Demonstrate Generic Programming. [K3]

REFERENCE BOOKS:

1. Programming in C++, Ashok N Kamthane, 2nd Edition, Pearson.
2. C++ How to Program, Paul J. Deitel, Harvey Deitel, 6th Edition, PHI publication.

Lecture Plan:

S.NO	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours required	Pedagogy	Teaching aids
1	CO1	Demonstrate how to debug basic programs using GDB compiler	K3	3	Lecture With Discussion	ICT
2		Develop programs on control structures	K3			
3		Construct programs for following concepts. a) Default Arguments b) Constant Arguments c) Reference Arguments	K3	3	Lecture With Discussion	ICT
4	CO2	Construct programs for following concepts. a) Classes & Objects b) Inline functions c) Static Member functions d) Overloading of Member Functions	K3	3	Lecture With Discussion	ICT

5		Develop programs for following concepts. a) Objects as Function Arguments b) Friend Functions, Friend class c) Local class d) Empty Class & Nested Classes	K3	3	Lecture With Discussion	ICT
6	CO3	Develop programs for following concepts. a) Default constructor b) Constructor with arguments c) Copy constructor	K3	3	Lecture With Discussion	ICT
7		Construct programs for following concepts. a) Binary b) Unary c) new d) delete	K3	3	Lecture With Discussion	ICT
8		Construct programs for following concepts. a) Single b) Multilevel c) Hierarchical d) Hybrid	K3	3	Lecture With Discussion	ICT
9		Demonstrate the use of Virtual Functions & Virtual Base class	K3	3	Lecture With Discussion	ICT
10		Develop programs to handle following Exceptions. a) Division-by-zero b) Overflow in an array	K3	3	Lecture With Discussion	ICT
11	CO4	Develop programs for following file handling operations. a) Copying text files b) Displaying the contents of the file	K3	3	Lecture With Discussion	ICT
12	CO5	Demonstrate Class template and Function Template.	K3	3	Lecture With Discussion	ICT
13		Demonstrate Sequential Containers & Associative Containers	K3	3	Lecture With Discussion	ICT

Total Hours: 36

Data Structures Lab

Academic Year: 2021-22

Semester: III Sem

Name of the Course: : Data Structures Lab

Programme: B.Tech

Section: A,B,C& D

Course Code: V20CSL04

COURSE OUTCOMES (Along with Knowledge Level):

After successful completion of the Course, the student will be able to:

V20CSL04.1	Construct Programs on Sorting and Searching Techniques	[K3]
V20CSL04.2	Illustrate various Operations on Linked Lists	[K3]
V20CSL04.3	Develop Programs on Stacks, Queues and their Applications	[K3]
V20CSL04.4	Develop Various Operations on Trees and Graphs	[K3]

Text Books:

1. Data Structures, algorithms and applications in C, SartajSahni, Universities press, Second Edition.
2. Fundamentals of Data Structures in C, Ellis Horowitz, SartajSahni and Dinesh Mehta, 2nd Edition, Universities Press (India) Pvt. Ltd.

Reference Books:

1. An Introduction to Data Structures with Application, Jean-Paul Tremblay , Paul Sorenson, Second Edition.
2. Fundamentals of Data Structures and algorithms by C V Sastry, RakeshNayak, Ch. Raja Ramesh, IK Publications, new Delhi.

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

Cos		CO1	CO2	CO3	CO4
Targeted Proficiency Level		75	75	75	75
Targeted level of Attainment	Level 3	70	70	70	70
	Level 2	65	65	65	65
	Level 1	55	55	55	55

Lecture Plan:

S.N O	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	-	-	-	
		Illustrate the Program for Selection sort	K3	3	Lecture With Discussion	ICT
		Illustrate the Program for Quick Sort	K3	3	Lecture With Discussion	ICT
		Illustrate the Program for merge sort	K3	3	Lecture With Discussion	ICT
		Illustrate the Programs for (a) Linear search (b) Binary search.	K3	3	Lecture With Discussion	ICT

S.No	Course Outcome	Intended Learning Outcomes(ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 2	Demonstrate Program for Single Linked List Insertion Operations	K3	3	Lecture with Discussion	ICT
2		Demonstrate Program for Single Linked List Delete and Display Operations	K3	3	Lecture with Discussion	ICT
3		Demonstrate Program for Double Linked List and its Operations	K3	3	Lecture with Discussion	ICT
4		Demonstrate Program for Double Linked List Delete and Display Operations	K3	3	Lecture with Discussion	ICT

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 3	Illustrate Programs for Stack and Queue Operations using Arrays	K3	3	Lecture with Discussion	Black Board
2		Illustrate Program for Circular Queue	K3	3	Lecture with Discussion	Black Board
3		Illustrate Program for Queue Operations using Linked List	K3	3	Lecture with Discussion	Black Board

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 4	Demonstrate the Programs for Depth First Search(DFS) and Breadth First Search(BFS)	K3	3	Lecture with Discussion	ICT
2		Demonstrate the Programs for Spanning Tree using Prim's Algorithm	K3	3	Lecture with Discussion	ICT
3		Demonstrate the Programs for Spanning Tree using Kruskal's Algorithm	K3	3	Lecture with Discussion	ICT

Total No. of Classes: 42

Linux Shell Scripting Lab

Academic Year: 2021-22

Year/ Semester: III

Name of the Course: Linux Shell Scripting Lab

Programme: B.Tech

Section: A,B,C& D

Course Code: V20CSL05

COURSE OUTCOMES (Along with Knowledge Level):

After successful completion of the Course, the student will be able to:

V20CSL05.1	Demonstrate the basic knowledge of Linux commands and utilities by using Linux shell environment	[K3]
V20CSL05.2	Experiment with the Concept of shell Programming on Files and Directories	[K3]
V20CSL05.3	Experiment with the Concept of shell Programming on File Permissions	[K3]
V20CSL05.4	Experiment with the Concept of shell Programming on Conditional Statements	[K3]
V20CSL05.5	Experiment with the Concept of shell Programming on Looping Statements	[K3]

Text Books:

1. UNIX and Shell Programming: A Textbook, Behrouz A. Forouzan | Richard F. Gilberg, Cengage Learning.
2. UNIX: Concepts and Applications, Sumithaba Das, 4th Edition, Tata McGrawHill.
3. Unix & Shell Programming, M.G.Venkatesh Murthy, Pearson Education.
4. UNIX shells by example, 4th Edition Ellie Quigley, Pearson Education

Reference Books:

- 1.Linux Command Line and Shell Scripting, Richard Blum, Wiley India Edition.

List Of Experiments

1. Experiment the following Unix Commands
 - a) General Purpose Utilities: cal, date,man,who.
 - b) Directory Handling Commands: pwd,cd,mkdir,rmdir.
 - c) File Handling Utilities: cat,cp,ls,rm,nl,wc.
 - d) Displaying Commands: head, tail.
 - e) Filters: cmp,comm.,diff,sort,uniq.
 - f) Disk Utilities: du,df.
2. Develop a Shell Program to Display all the words which are entered as command line arguments.
3. Develop a shell script that Changes Permissions of files in PWD as rwx for users.
4. Develop a shell script to print the list of all sub directories in the current directory.

5. Develop a Shell Program which receives any year from the keyboard and determine whether the year is leap year or not. If no argument is supplied the current year should be assumed.
6. Develop a shell script which takes two file names as arguments-If their contents are same then delete the second file.
7. Develop a shell script to print the given number in the reversed order.
8. Develop a shell script to print first 25 Fibonacci numbers.
9. Develop a shell script to print the Prime numbers between the specified range.
10. Develop a shell script to delete all lines containing the word 'unix' in the files supplied as arguments.
11. Develop a shell script Menu driven program which has the following options.
 - i) contents of /etc/passwd.
 - ii) list of users who have currently logged in.
 - iii) present working directory.
 - iv) exit.

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

COs		CO1	CO2	CO3	CO4	CO5
Targeted Proficiency Level		75	75	75	75	75
Targeted level of Attainment	Level 3	70	70	70	70	70
	Level 2	65	65	65	65	65
	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	Dissemination of Department Vision, Mission, PEOs, POs, PSOs	-	1	Lecture With Discussion	ICT
		Demonstrate Linux Commands overview and how to interact with Putty Server.	K3	2	Lecture With Discussion	ICT
2		Experiment basics of Linux Commands.	K3	3	Lecture With Discussion	ICT
3		Experiment General Purpose Utilities.	K3	3	Lecture With Discussion	ICT
4		Experiment Displaying Commands.	K3	3	Lecture With Discussion	ICT
5		Experiment Commands on Filters.	K3	3	Lecture With Discussion	ICT
6		Experiment Disk Handling Utilities.	K3	3	Lecture With Discussion	ICT

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 2	Experiment Directory Handling Commands.	K3	3	Lecture With Discussion	ICT
2		Experiment File Handling Utilities.	K3	3	Lecture With Discussion	ICT
3		Develop a shell script to print the list of all sub directories in the current directory.	K3	3	Lecture with Discussion	ICT

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 3	Develop a shell script that Changes Permissions of files in PWD as rwx for users.	K3	3	Lecture with Discussion	ICT

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 4	Develop a Shell Program which receives any year from the keyboard and determine whether the year is leap year or not. If no argument is supplied the current year should be assumed.	K3	3	Lecture with Discussion	ICT
2		Develop a shell script which takes two file names as arguments-If their contents are same then delete the second file.	K3	3	Lecture with Discussion	ICT

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 5	Develop a shell program to a) Display all the words which are entered as command line arguments. b) Print the given number in the reversed order.	K3	3	Lecture with Discussion	ICT

2		Develop a shell script to delete all lines containing the word 'unix' in the files supplied as arguments.	K3	3	Lecture with Discussion	ICT
3		Develop a shell script to print a)First 25 Fibonacci numbers b)The Prime numbers between the specified range.	K3	3	Lecture with Discussion	ICT
4		Develop a shell script Menu driven i) contents of /etc/passwd ii) list of users who have currently logged in. iii) present working directory. iv) exit.	K3	3	Lecture with Discussion	ICT

Total No. of Classes: 48

Professional Communication Skills - I

Academic Year: 2021-22

Year/ Semester: III

Name of the Course: Professional Communication Skills - I

Programme: B.Tech

Section: A,B,C& D

Course Code: V20ENT02

COURSE OUTCOMES (Along with Knowledge Level):

After successful completion of the Course, the student will be able to:

CO1: Use vocabulary in regular chores of life with accuracy, make meaningful sentences, and describe people and their traits vividly. (K3)

CO2: Distinguish between places of pilgrimage and holiday spots; describe incidents, things and process; and frame questions, statements and expressions. (K4)

CO3: Demonstrate their knowledge of idioms which are similar to those of native speakers while speaking and writing and use phrases clearly and precisely to articulate their views that compare and contrast indianisms with native expressions and avoid common errors. (K3)

CO 4: Employ the vocabulary of netizens with ease and walk through the letters and emails for effective official correspondence and infer the accurate meaning of the homophones that are often confusing. (K3)

CO5: Summarize their profile; introduce themselves as well as others by incorporating their accomplishments and Sketch stories and anecdotes in an interesting and engaging manner that arouses curiosity of the audience. (K5)

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

Course Outcome	Targeted Proficiency Level (% of Marks)	Targeted level of Attainment (% Students)
1	50	60
2	50	60
3	50	60
4	50	60
5	50	60
6	50	60

CO 1

S. No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 1	Find appropriate vocabulary to describe occupations, kitchen utensils and tools . Ice-breaking session	K3	1	Lecture& Discussion	BB/Handout
2		Find appropriate vocabulary to describe spices, vegetables, flowers, sciences of study and professions	K3	1	Lecture& Discussion	BB/Handout
3		Find appropriate vocabulary to describe spices, vegetables, flowers, sciences of study and professions	K3	1	Lecture & Discussion	BB/ Handout
4		Tool-based Activity		1		
5		Construct questions , frame statements and use expressions related to vocabulary learnt Activity	K3	1	Lecture & Discussion	BB/ Handout.
6		Select suitable words and expressions to describe people and physical characteristics	K3	1	Lecture & Discussion	BB/ Handout.
7		Select suitable words and expressions to talk about mental attributes of people and various professions	K3	1	Lecture & Discussion	BB/ Handout.
8		Select suitable words and expressions to talk about mental attributes of people and various professions	K3	1	Lecture & Discussion	BB/ Handout.
9		Construct questions, frame statements and use expressions related to vocabulary learnt. Activity	K3	1	Lecture & Discussion	BB/ Handout
10		Tool-based Activity		1		

CO 2

S.No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 2	Describe favorite places and famous places using appropriate vocabulary	K2	1	Lecture & Discussion	BB/Handout
2		Describe places of pilgrimage and holiday spots	K2	1	Lecture & Discussion	BB/Handout
3		Describe places of pilgrimage and holiday spots. Activity	K2	1	Lecture & Discussion	BB/Handout
4		Tool-based Activity		1		
5		Use suitable expressions to describe a thing and an incident	K3	1	Lecture & Discussion	BB/Handout.
6		Use suitable expressions to describe a thing and an event	K3	1	Lecture & Discussion	BB/Handout.
7		Distinguish between the vocabulary and expressions used to describe a process and a recipe.	K3	1	Lecture & Discussion	BB/Handout.
8		Distinguish between the vocabulary and expressions used to describe a process and a recipe.	K3	1	Lecture & Discussion	BB/Handout.
9		Construct questions, frame statements and use expressions related to vocabulary learnt. Activity	K3	1	Lecture & Discussion	BB/Handout
10		Tool-based Activity		1		

CO 3

S. No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 3	Use idioms and phrases in day to day conversation both in written and spoken	K3	1	Lecture & Discussion	BB/Handout
2		Use idioms and phrases in day to day conversation both in written and spoken	K3	1	Lecture & Discussion	BB/Handout
3		Compare and contrast using “as...as” expressions. Activity	K4	1	Lecture & Discussion	BB/Handout
4		Tool-based Activity		1		
5		Examine common mistakes in written and spoken.	K4	1	Lecture & Discussion	BB/Handout.

6		Examine common mistakes in written and spoken.	K4	1	Lecture & Discussion	BB/ Handout.
7		Activity on common errors		1	Lecture & Discussion	BB/ Handout.
8		Compare and contrast Indianisms with native expressions	K4	1	Lecture & Discussion	BB/ Handout.
9		Compare and contrast Indianisms with native expressions	K4	1	Lecture & Discussion	BB/ Handout
10		Tool-based Activity		1		

CO 4

S. No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 4	Find the vocabulary of netizens	K3	1	Lecture & Discussion	BB/Handout
2		Use Acronyms and abbreviations that are often used by netizens.	K3	1	Lecture & Discussion	BB/Handout
3		Infer the meaning of the homophones that are often confusing.	K4	1	Lecture & Discussion	BB/ Handout
4		Activity related to Homophones		1		
5		Tool-based Activity		1	Lecture & Discussion	BB/ Handout.
6		Use the correct format for writing both formal and informal letters	K3	1	Lecture & Discussion	BB/ Handout.
7		Organise ideas and draft emails (Business mail)	K3	1	Lecture & Discussion	BB/ Handout.
8		Organise ideas and draft emails (Project status mails, informative mails)	K3	1	Lecture & Discussion	BB/ Handout.
9		Activity (writing practice)		1	Lecture & Discussion	BB/ Handout
10		Tool-based Activity		1		

CO 5

S. No	Course Outcome	Intended Learning Outcomes (ILO)	Knowledge Level of ILO	No. of Hours	Pedagogy	Teaching aids
1	CO 5	Summarize the strengths, weaknesses and goals	K5	1	Lecture & Discussion	BB/Handout
2		Summarize personal and academic achievements	K5	1	Lecture & Discussion	BB/Handout
3		Activity (Face to face Interviews)		1	Lecture & Discussion	BB/Handout
4		Tool-based Activity		1		
5		Develop Resume	K3	1	Lecture & Discussion	BB/Handout.
6		Develop Resume(Practice)	K3	1	Lecture & Discussion	BB/Handout.
7		Sketch stories and anecdotes in an interesting and engaging manner	K3	1	Lecture & Discussion	BB/Handout.
8		Sketch stories and anecdotes in an interesting and engaging manner	K3	1	Lecture & Discussion	BB/Handout.
9		Activity (Story narration)	K3	1	Lecture & Discussion	BB/Handout
10		Tool-based Activity		1		