



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))

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

Department of Computer Science & Engineering (Accredited by NBA)

**Minutes of the
Second Board of
Studies held on
20/04/2019 at 10:00
AM**

SRI VASAVI ENGINEERING COLLEGE (AUTONOMOUS)

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

Department of Computer Science & Engineering (Accredited by NBA)

Date: 22-04-2019

Minutes of meeting of 2nd BOS held on 20.04.2019 at 10:00 AM

Venue: PG CP Lab

Item No. 1: Introducing members of BOS by Chairperson.

The Chairperson BOS extended a formal welcome and introduced the members.

Item No. 2: Review of the syllabus approved for the Academic Year 2018-19(B.Tech)

- (i) As per the discussions by the BOS members, no changes were suggested in the Syllabus.

Item No. 3: Suggest modification for the existing Course Structure (B.Tech).

- i) The courses namely **Employability Skills-I (V18ENT03)** and **Employability Skills-II(V18ENT04)** were renamed by BOS of English as **Professional Communication Skills – I (V18ENT03)** and **Professional Communication Skills –II (V18ENT04)**.
- ii) A new MNC course by name **Technical Skills-I (V18CST60)** & **Technical Skills-II (V18CST61)** were suggested by the committee to be offered in the III Sem & IV Sem respectively.
- iii) The Course Structure & Syllabus for these four courses are placed in **Annexure-I**.

Item No. 4: Change of course (II SEM) in the Approved course structure (M.Tech)

To provide advanced courses the committee recommended **Deep Learning (V18CTT19)** Course in place of **Artificial Intelligence (V18CTT12)** in Elective-I. The revised Course Structure is proposed in **Annexure-II**.

Item No.5: Syllabi for the proposed courses offered in III and IV semesters of B.Tech Programme for the Academic Year 2019-20 & M.Tech(CSE) II Sem.

- (i) The proposed Syllabi is given in **Annexure-III**.
- (ii) Syllabus is approved for the courses offered to EEE & ECE Programmes, is given in **Annexure-IV**.

S.No.	Programme	SEM	Course Code	Course Name
1	EEE	III	V18CSL31	Data Structures & Algorithms Lab
2	EEE	IV	V18CSL33	Python Programming Lab
3	ECE	IV	V18CSL32	Object-Oriented Programming Through Java Lab

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.

iii) **M.Tech , Deep Learning (V18CTT19)** Course Syllabus is proposed in **Annexure-V**.

Item No.6: Any other item with the permission of chair.

We are awaiting for the approval of new Programme Computer Science & Technology (CST) for the A.Y 2019-20. As suggested by the BOS, it has been decided to adopt the same Syllabi & Course Structure of I& II SEM CSE for CST also. The Course Structure is proposed in **Annexure-VI**.



Dr.D.JayaKumari
BOS Chairperson

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

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Annexure-I

II B.TECH

III - Semester

S.No.	III - Semester						
	Course Code		Course	L	T	P	C
1	V18MAT04	BSC	Probability & Statistics	3	1	0	4
2	V18ECT06	ESC	Digital Electronics	3	0	0	3
3	V18CST02	PCC	Data Structures and Algorithms	3	0	0	3
4	V18CST03	ESC	Discrete Mathematics	3	0	0	3
5	V18CST04	ESC	Object Oriented Programming for problem Solving	3	0	0	3
6	V18ECL04	ESC	Digital Electronics Lab	0	0	2	1
7	V18CSL02	PCC	Data Structures and Algorithms Lab	0	0	3	1.5
8	V18CSL03	ESC	Object Oriented Programming for problem Solving Lab	0	0	3	1.5
9	V18ENT03		Professional Communication Skills – I	3	0	0	MNC
10	V18CST60		Technical Skills-I	0	0	4	MNC
Total				18	1	12	20

Total Contact Hours: 31

IV - Semester

S.No	IV - Semester						
	Course Code		Course	L	T	P	C
1	V18CST05	PCC	Computer Organization	3	0	0	3
2	V18CST06	PCC	Software Engineering	3	0	0	3
3	V18CST07	PCC	Formal Languages and Automata Theory	3	0	0	3
4	V18CST08	PCC	Java Programming	3	0	0	3
	V18CST09	PCC	Python Programming	3	0	0	3
5	V18MBET51	HSS	Managerial Economics and Financial Accountancy	3	0	0	3
6	V18CSL04	PCC	Java Programming Lab	0	0	3	1.5
7	V18CSL05	PCC	Python Programming Lab	0	0	3	1.5
8	V18ENT11		Constitution of India	2	0	0	MNC
9	V18ENT04		Professional Communication Skills – II	3	0	0	MNC
10	V18CST61		Technical Skills -II	0	0	4	MNC
Total				23	0	10	21

Total Contact Hours: 33

III Sem	Technical Skills-I	Course Code:	L	T	P	C
		V18ENT60	0	0	4	MNC
Branch	CSE					

Problem Solving using C-I

Course Outcomes:

CO1: Interpret the problem and find the logic to produce solution (K2)

CO2: Develop programs to solve Real world problems (K3)

CO3: Apply debugging techniques to find defects and errors in problem solution(K3)

Syllabus

1. I/O Statements, Operators and Expressions
2. Problem Solving Using Conditional Statements
3. Looping Constructs
4. Functions
5. 1-D Arrays
6. 2-D Arrays
7. Strings

Text Books:

1. Let us C: Yesvanth P. Kanetkar, BPB Publications, 16th Edition
2. Working With C, Yashavant P. Kanetkar, BPB Publications
3. Test Your C Skills, Yashavant P. Kanetkar, BPB Publications

IV Sem	Technical Skills-II	Course Code:	L	T	P	C
		V18ENT61	0	0	4	MNC
Branch	CSE					

Problem Solving using C -II

Course Outcomes:

CO1: Interpret the problem and find the logic to produce solution (K2)

CO2: Develop programs to solve Real world problems (K3)

CO3: Apply debugging techniques to find defects and errors in problem solution(K3)

Syllabus

1. Pointers
2. Functions and Pointers
3. Recursion
4. File Handling
5. Structures and Union
6. Enum, Preprocessors, Command Line Arguments

Text Books:

1. Let us C: Yesvanth P. Kanetkar, BPB Publications, 16th Edition
2. Working With C, Yashavant P. Kanetkar, BPB Publications
3. Test Your C Skills, Yashavant P. Kanetkar, BPB Publications
4. Understanding Pointers in C, Yashavant P. Kanetkar, BPB Publications



SRIVASAVI ENGINEERING COLLEGE::Pedatadepalli, Tadepalligudem
(Autonomous)
Syllabus for the Regulation Year 2019-2020 (Common to all Branches)
Professional Communication Skills - I
B.Tech IIISemester

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT03	Professional Communication Skills - I	3	-	-	MNC

Students will be able to

CO1: Summarize one's introduction in an appropriate manner, exhibit grammatical competence through correction of sentences, analyze noun and pronoun dispositions and develop pre-reading strategies to improve comprehension skills.[K5]

CO2: Distinguish singular and plural in different contexts and display knowledge through accurate usage of sentences, build conversations which befit the situations, comprehend the passages well and, use different kinds of idioms. [K4]

CO3: Classify various kinds of adjectives and adverbs, learn natural occurrence of paired words of native speakers, infer the referential and inferential aspects of the passages and make use of idioms while narrating personal experiences. [K4]

CO 4: Judge and assess the behaviour of people in day to day life using kinesics and proxemics that disclose their disposition and be aware of their personal traits that promote good relations. (K2)

CO5: Articulate their goals and have a constructive plan of executing them properly and become adept in oral presentations as well as poster presentations that enhance their professional skills. (K3)

CO6: Evaluate various happenings by thinking out of the box and display their latent talent. They can also reduce the stress levels by applying various stress management techniques. (K4)

Syllabus

UNIT – I: SELF-INTRODUCTION: Basic information - Academic and personal - interests - strengths and weaknesses - goal.**ERROR ANALYSIS:** Nouns & Pronouns – Singular & Plural – Kinds of Nouns & Pronouns- Collective Nouns - Personal and Reflexive Pronouns.**READING COMPREHENSION:** Reading as a skill – quick reading - analyzing – answering **IDIOMS & PHRASES:** Colloquial expressions – formal and informal expressions.

UNIT – II: ERROR ANALYSIS: Concord – Subject – Verb agreement.**ROLE PLAY:** Day to day situations - practical approach – real life experiences.**READING COMPREHENSION:** Skimming – scanning - summarizing – problem solving.**IDIOMS & PHRASES:** Enriching written and spoken English – use and usage.

UNIT – III: ERROR ANALYSIS: Adjectives – Adverbs – role of modifiers – place of Adjectives – Adverbs of frequency.**COLLOCATIONS:** Natural combination of words – closely affiliated with each other.

READING COMPREHENSION: At a glance – close reading – understanding – answering **IDIOMS & PHRASES:** Communicative - expressive – competent.

UNIT –IV: INTER AND INTRA PERSONAL SKILLS: Leading, Coaching, Interviewing, Managing, Persuading - Self awareness, Self confidence, Good Attitude. **BODY LANGUAGE:** Basics of proxemics and kinesics.

UNIT -V

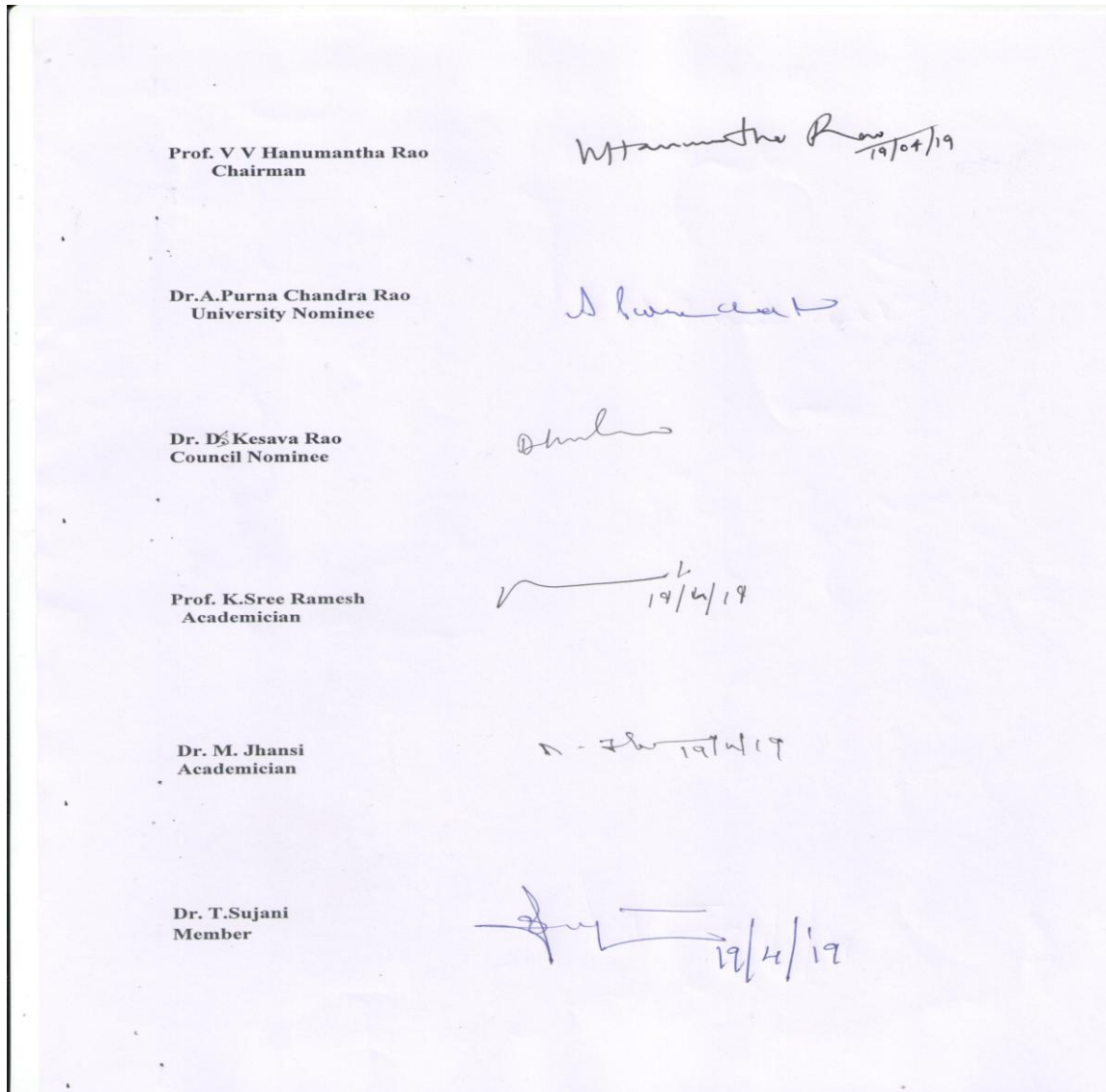
PRESENTATION SKILLS: Importance of Presentation skills, Structuring our presentations, Ways to improve our presentation skills, Tips for effective presentations. – oral – Power point – poster.

GOAL SETTING: Short-term – long-term – aim – target – vision – How to set SMART goals.

UNIT – VI: LATERAL THINKING: What is creativity, Fundamental approaches to smart thinking, Characteristics of a creative person, Convergent and Divergent thinking.**STRESS MANAGEMENT:** Meaning of Stress, Types of Stress, Symptoms of stress, Short term and long term stress, how can people manage stress.

Reference:

1. Essential English Grammar - Raymond Murphy
2. Advanced English Grammar - D.S. Paul
3. Word Power Made Easy - Norman Lewis
4. English collocations in use - Michael McCarthy
5. Word Power Made Handy - Shalini Varma
6. Barron's GRE - Barron's
7. Current English Grammar & Usage - R.P Sinha
8. Think & Grow Rich - Napoleon Hill
9. Soft Skills for Everyone - Butterfield, Jeff,
10. Soft Skills - Chauhan, G.S. and Sangeeta Sharma
11. Theories of Personality - Hall, Calvin S
12. Corporate Conversations - Holtz, Shel
13. Communication Skills - Kumar, Sanajy and PushpLata
14. Winning at Interviews - Thorpe, Edgar and Showick Thorpe
15. Swami Vivekananda and "Personality Development" published by RK Math.





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Department of Basic Sciences & Humanities

Board of Studies of English

The following members attended the Second Meeting of Board of Studies of English held on 19/04/2019 at 10:00AM in Srinivasa Ramanujan Hall of Learning (E-block) at the Department of BS&H.

Members present:

S.No	Name of the Member	Designation & Address	Designation on BOS	Signature
1	Prof. V V Hanumantha Rao	Professor of English Sri Vasavi Engineering College	Chairman	
2	Dr. A Purna Chandra Rao	Assoc.Professor of English, PVP Siddhartha Institute of Technology, Vijayawada	University Nominee	
3	Dr. D. Kesava Rao	Professor of English, NIT Warangal	Council Nominee	
4	Prof. K. Sree Ramesh	Professor of English and Principal, College of Arts & Commerce Adikavi Nannaya University Rajamahendravaram	Academician	
5	Dr. M. Jhansi	Reader in Politics (Retd) S.K.S.D. Women's College, Tanuku	Academician	
6	Mr. N Raja Sekhar	Associate Professor of Mathematics & HOD Basic Sciences & Humanities Sri Vasavi Engineering College	Member	
7	Dr. T.Sujani	Associate Professor of English & Section Head of Training Sri Vasavi Engineering College	Member	
8	Dr. K.Venkata Rao	Sr. Assistant.Professor of English Sri Vasavi Engineering College	Member	
9	Sri. K.V.Rama Rao	Assistant.Professor of English Sri Vasavi Engineering College	Member	
10	Smt. K.Radha Madhavi	Assistant.Professor of English Sri Vasavi Engineering College	Member	
11	Smt. Ch. Tanuja	Assistant.Professor of English Sri Vasavi Engineering College	Member	
12	Smt. K.V.L.B.Devi	Assistant.Professor of English Sri Vasavi Engineering College	Member	
13	Sri. B. Anjaneyulu	Assistant.Professor of English Sri Vasavi Engineering College	Member	

14	Sri.D.Naveen Kumar	Assistant.Professor Sri Vasavi Engineering College Department of MBA	Member	<i>NDK</i>
15	Dr.SP Malarvizhi	Associate Professor Sri Vasavi Engineering College Department of CSE	Member	<i>SP.M</i>
16	KN H Srinivas	Associate Professor Sri Vasavi Engineering College Department of ECE	Member	<i>KNH</i>
17	Dr. K Ramesh Reddy	Associate Professor Sri Vasavi Engineering College Department of ME	Member	<i>KR</i>
18	G Govardhan	Assistant.Professor Sri Vasavi Engineering College Department of EEE	Member	<i>GG</i>

S.No	Name of the Member	Designation & Address	Designation	Signature
1	Dr. P. Srinivas Reddy	Assistant Professor Sri Vasavi Engineering College Department of CSE	Member	<i>PSR</i>
2	Dr. S. Venkatesh Reddy	Assistant Professor Sri Vasavi Engineering College Department of ECE	Member	<i>SVR</i>
3	Dr. K. Ramesh Reddy	Assistant Professor Sri Vasavi Engineering College Department of ME	Member	<i>KR</i>
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12	Dr. K. Ramesh Reddy	Assistant Professor Sri Vasavi Engineering College Department of ME	Member	<i>KR</i>
13	Dr. K. Ramesh Reddy	Assistant Professor Sri Vasavi Engineering College Department of ME	Member	<i>KR</i>



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Syllabus for the Regulation Year 2019-20 (Common to all Branches)

**Professional Communication Skills – II
B.Tech IV Semester**

S.No	Course Code	Course Name	L	T	P	C
1	V18ENT04	Professional Communication Skills - II	3	-	-	MNC

The students will be able to

CO1: Correlate individual words into one whole sentence using new vocabulary and focus on the error analysis of prepositions and conjunctions. [K4]

CO2: Distinguish and acquire knowledge of using words of same category in a sentence and learn new words that promote communicative finesse. [K5]

CO3: Find errors in sentences where the modifiers are misplaced and put them at the appropriate place, use hit pair words and send an email that is concise and lucid[K5]

CO 4: Interpret the importance of Attire and Etiquette in societal context and manage their time. (K2)

CO5: Discover the team working abilities among themselves and display their leadership qualities. (K3)

CO6: Identify various elements of emotional balance that have positive impact on work-life-balance. (K2)

Syllabus

UNIT – I:ERROR ANALYSIS: Prepositions - kinds of prepositions –appropriate use - conjunctions –sub-ordinating– co-ordinating. **VOCABULARY:** Etymology – roots – suffixes – prefixesand one word substitutes.**SENTENCE IMPROVEMENT:** Better choice – error-free sentences – effective – syntax.

UNIT – II: ERROR ANALYSIS: Parallel grammatical forms – same grammatical structures.**VOCABULARY:** Words that describe personalities – faiths – professions – medical specialistsand Word Clusters.**EXPANSION OF PROVERBS:** Meaning – interpretation – explanation.

UNIT – III: ERROR ANALYSIS: Dangling modifiers – misplacement of modifiers – arrangement.**VOCABULARY:** Antonyms and Synonymsand Foreign expressions.**EMAIL WRITING:** Format – method of exchanging – technicalities.

UNIT- IV: ATTIRE & ETIQUETTE: Formal – informal- professional – social Attires, Meaning of Etiquette, Need for etiquette, Types of Etiquette. **TIME - MANAGEMENT:** Value of time – Setting priorities – effective use of time – ABCD analysis, Pareto Principle, Eisenhower Method.

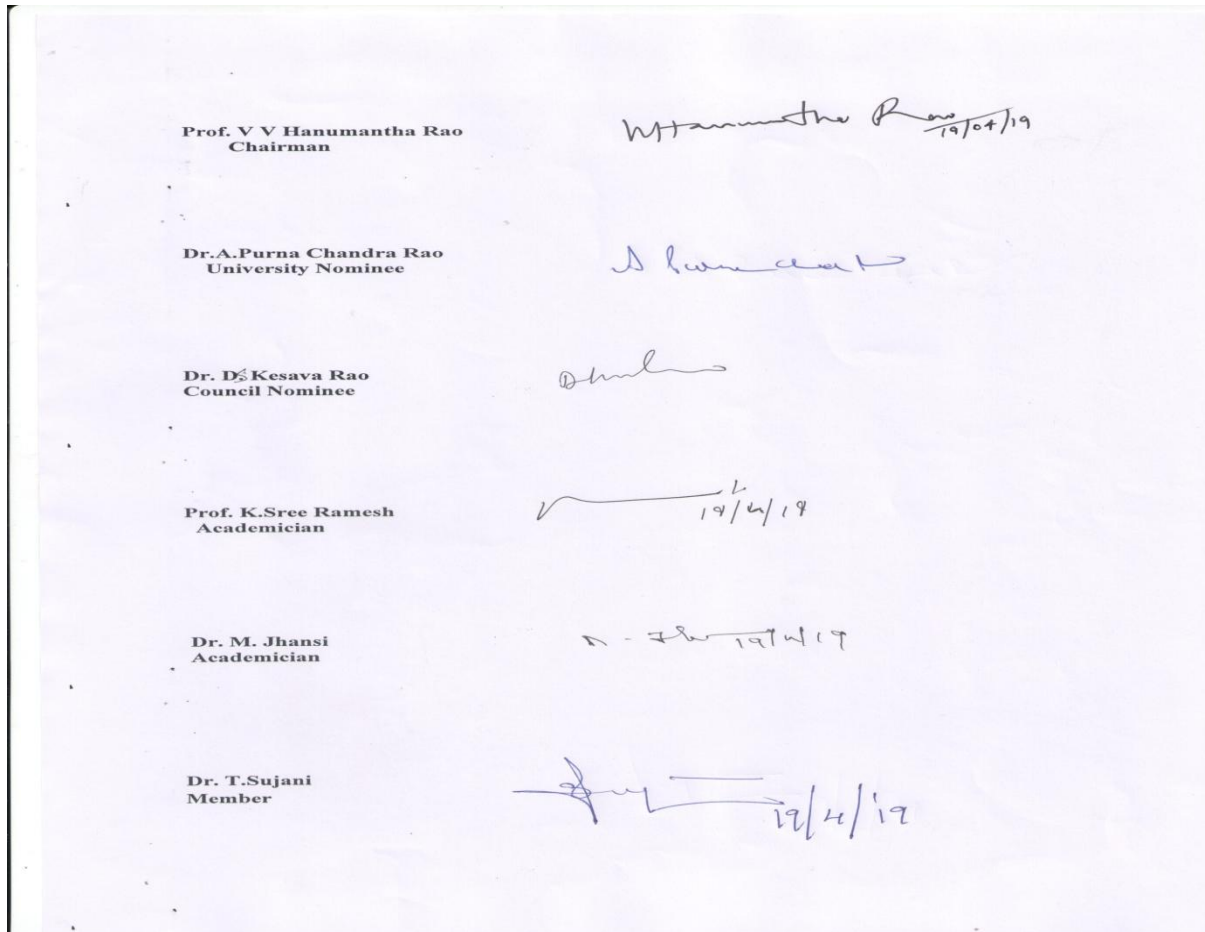
UNIT –V: TEAM WORK – Benefits of working with a team – Team Dynamics **.LEADERSHIP QUALITIES:** Leadership Styles, Characteristics of a Good Leader, Big 5 Personality traits, Myths about leadership qualities.

UNIT –VI: EMOTIONAL INTELLIGENCE: What is EI – Daniel Goleman model of EI, Qualities of an Emotionally Intelligent Person - Emotional balance – feelings – thoughts – motivation.

WORK – LIFE - BALANCE: Personal life – professional life – cause of work-life imbalances, consequences of work-life imbalance, Role of gender and family – improving work life balance.

Reference:

1. Essential English Grammar - Raymond Murphy
2. Advanced English Grammar - D.S. Paul
3. Word Power Made Easy - Norman Lewis
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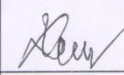
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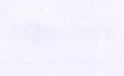
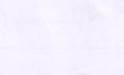







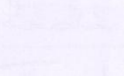
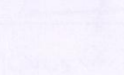
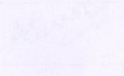

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15	Dr.SP Malarvizhi	Associate Professor Sri Vasavi Engineering College Department of CSE	Member	
16	K N H Srinivas	Associate Professor Sri Vasavi Engineering College Department of ECE	Member	
17	Dr. K Ramesh Reddy	Associate Professor Sri Vasavi Engineering College Department of ME	Member	
18	G Govardhan	Assistant.Professor Sri Vasavi Engineering College Department of EEE	Member	

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1	Dr. P. S. Srinivasan	Professor of English Sri Vasavi Engineering College	Member	
2	Dr. A. Srinivas	Associate Professor of English Sri Vasavi Engineering College	Member	
3	Dr. K. Srinivas Reddy	Professor of English, Sri Vasavi Engineering College	Member	
4	Dr. K. Srinivas	Professor of English Sri Vasavi Engineering College	Member	
5	Dr. M. Srinivas	Professor of English Sri Vasavi Engineering College	Member	
6	Dr. K. Srinivas	Associate Professor of English Sri Vasavi Engineering College	Member	
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11	Dr. K. Srinivas	Associate Professor of English Sri Vasavi Engineering College	Member	
12	Dr. K. Srinivas	Associate Professor of English Sri Vasavi Engineering College	Member	
13	Dr. K. Srinivas	Associate Professor of English Sri Vasavi Engineering College	Member	



SRI VASAVI ENGINEERING COLLEGE (Autonomous)

PEDATADEPALLI, TADEPALLIGUDEM-534 101

Department of Computer Science & Engineering

Annexure-II

I-SEMESTER

S.No.	Course Code	Course	L	T	P	C
1	V18CTT01	Object Oriented Software Engineering	3	-	-	3
2	V18CTT02	NOSQL Database	3	-	-	3
3	V18CTT03	Advanced Computer Architecture	3	-	-	3
4	V18CTT04	Advanced Operating Systems	3	-	-	3
5	V18CTT05	Advanced Data Structures and Algorithm Analysis	3	-	-	3
6	V18CTT06	Machine Learning	3	-	-	3
7	V18CTL01	NOSQL Database Lab	-	-	2	1
8	V18CTL02	Advanced Data Structures and Algorithm Analysis Lab	-	-	2	1
9	V18CTT41	Seminar-I	-	2	-	2
Total Credits			18	2	4	22

**L = Lecture, T = Tutorial, P = Practical & C = Credits*

Total Contact Hours=24

II-SEMESTER

S.No.	Course Code	Course	L	T	P	C
1	V18CTT07	Data Science	3	-	-	3
2	V18CTT08	Advanced Web Technologies	3	-	-	3
3	V18CTT09	Cloud Computing	3	-	-	3
4	V18CTT10	Internet of Things	3	-	-	3
5	Elective-I		3	-	-	3
	V18CTT11	1) Cyber Security				
	V18CTT19	2) Deep Learning				
	V18CTT13	3) Bioinformatics				
	V18CTT14	4) Wireless Sensor Networks				
6	Elective-II		3	-	-	3
	V18CTT15	1) Image Processing				
	V18CTT16	2) Parallel Algorithms				
	V18CTT17	3) Mobile Computing				
	V18CTT18	4) Grid Computing				
7	V18CTL03	Data Science Lab	-	-	2	1
8	V18CTL04	Advanced Web Technologies Lab	-	-	2	1
9	V18CTT42	Seminar-II	-	2	-	2
Total Credits			18	2	4	22

**L = Lecture, T = Tutorial, P = Practical & C = Credits*

Total Contact Hours=24

III Sem	PROBABILITY AND STATISTICS	Course Code: VI8MAT04	L	T	P
			3	1	0

Syllabus Details

Course Outcomes: At the end of the Course student will be able to:

- CO1:** Find measures of central tendency and dispersion for real data sets.
- CO2:** Find parameters of given function
- CO3:** Apply probability distribution to real time problems
- CO4:** Plot a best fit curve to an experimental data and find the correlation and regression
- CO5:** Create good estimators to various parameters
- CO6:** Apply the principles of Statistical Inference to practical problems

Unit-I: Basic Statistics

Measures of Central Tendency: Mean, Median, Mode

Measures of Dispersion: Variance, Standard deviation, Skewness and Kurtosis

Unit-II: Basic Probability

Random Variables: Discrete and continuous - Probability function – density and distribution function, Expectation of a Random Variable, Moments, Chebychev's Inequality (Without proof).

Unit-III: Probability Distributions

Probability distributions: Binomial, Poisson and Normal - Evaluation of statistical parameters: Mean, Variance and their properties, Introduction to Exponential, Gamma and Weibull distributions.

Unit-IV: Bivariate Distributions

Curve fitting by the method of Least squares- Fitting of straight line, parabola and exponential curves, Simple Correlation and Regression – Rank correlation.

Unit-V: Sampling Distribution and Estimation

Introduction –Sampling distribution of means with known and unknown standard deviation

Estimation: Criteria of a good estimator, point and interval estimators for means and proportions

Unit-VI: Tests of Hypothesis

Introduction-Type-I, Type-II Errors, Maximum Error, one-tail, two-tail tests, Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means.

Test of significance: Small sample test for single mean, difference of means and test of ratio of variances (F-Test) - Chi-square test for goodness of fit and independence of attributes.

Text Books:

- B. V. Ramana**, A text Book of Engineering Mathematics, Tata McGraw Hill.
- Miller & Freund's**, Probability & Statistics for Engineers – Eighth Edition, Richard. A. Johnson

References Books:

- S. Ross**, “A First Course in Probability”, Pearson Education India, 2002.
- Dr.T.S.R.Murthy**, Probability and Statistics for Engineers, BS Publications.
- T. Veerarajan**, “Engineering Mathematics”, Tata McGraw-Hill, New Delhi, 2010.

III Sem	DIGITAL ELECTRONICS	Course Code: V18ECT06	L	T	P
			3	1	0

1. Course Outcomes: At the end of the Course student will be able to:

- CO1: Illustrate the conversion of a number from one number system to another .
 CO2: Classify Boolean theorems & simplify the Boolean functions using the Boolean properties.
 CO3: Use K-map as a tool to simplify and design logic circuits
 CO4: Construct different combinational Logic circuits like MUX, Decoders, Encoders etc.
 CO5: Demonstrate the basic flip-flops in terms of truth table & excitation table
 CO6: Apply the concepts of flip-flops in the designing of different sequential circuits like registers, counters, etc.

2. Syllabus Details**Course Outcomes: At the end of the Course student will be able to:****UNIT I: Number systems & Binary codes:**

Number systems: Number Systems, Radix conversions, complement of numbers. Binary codes: Binary codes, Weighted and non-Weighted codes, BCD code, gray code, excess 3 codes.

UNIT -II: Concept of Boolean algebra:

Basic Theorems and Properties of Boolean algebra, Boolean Functions, Canonical and Standard Forms, Minterms and Maxterms, Logic gates: NOT, OR, AND, NOR, NAND, XOR, XNOR - Universal gates.

UNIT- III: Gate level Minimization:

Map Method, Two-Variable K-Map, Three-Variable K-Map, Four Variable K-Maps. Products of Sum Simplification, Sum of Products Simplification, Don't – Care Conditions, NAND and NOR Implementation.

UNIT- IV: Combinational Logic:

Introduction, Analysis Procedure, Design Procedure, Binary Adder–Subtractor, Decimal Adder, Decoders, Encoders, Multiplexers.

UNIT V: Sequential Logic Circuits:

Introduction –Latches and Flip flops: Basic Flip flop circuit, RS, D, JK and T Flip-flops – Triggering of Flip flops: Master Slave Flip flop, edge triggered flip flop – Conversion of one type of Flip flop to another.

UNIT -VI: Registers and Counters:

Registers and Counters: Shift Register, Universal Shift Register, Applications of Registers, Asynchronous counter, Synchronous counter, Mod-N Counter, binary up/down counter, Ring counter, Johnson counter.

Memories: Introduction to ROM, PROM, EPROM.

TEXT BOOKS:

1. Digital Design, 5/e, M.Morris Mano, Michael D Ciletti, PEA.
2. Fundamentals of Logic Design, 5/e, Roth, Cengage.

REFERENCE BOOKS:

1. Digital Logic and Computer Design, M.Morris Mano, PEA.
2. Digital Logic Design, Leach, Malvino, Saha, TMH.
3. Modern Digital Electronics, R.P. Jain, TMH.

III Sem	DATA STRUCTURES AND ALGORITHMS	Course Code: V18CST02	L	T	P
			3	0	0

Syllabus Details

Course Outcomes: At the end of the Course student will be able to:

CO1: Explain Sorting and searching techniques.	[K2]
CO2: Demonstrate Singly Linked Lists, Double Linked List.	[K3]
CO3: Interpret the Basic Concepts in Data Structures, Stacks, Queues	[K3]
CO4: Demonstrate Binary Trees and BST	[K3]
CO5: Compare Binary trees with self-balanced tree with appropriate examples	[K4]
CO6: Develop various graph algorithms.	[K3]

2. Syllabus

UNIT I: Algorithm Notations - performance analysis: Space complexity, time complexity – Asymptotic notation: Big O, Omega and Theta.

Sorting: Bubble Sort, Insertion Sort, Selection Sort, Quick Sort, Merge Sort, Radix Sort. **Searching:** Linear Search, Binary Search. Introduction to Hashing.

UNIT II: Types of Data Structures – Linear data structures and non-linear data structures. Representation of arrays - polynomial representation, addition of two polynomials, sparse representation, transpose of sparse matrix.

Single linked list: Representation of node, operations on single linked list, reverses the linked list,

Double linked list: operations like insert delete and display. Circular linked List.

UNIT III: Stacks Definition, array representation, linked list representation, Towers of hanoi, infix to postfix conversion, expression evolution, Multistack.

Queues definition, Array representation, linked list representation, operations on queues, Applications of Queues, Circular Queue.

UNIT IV: Trees: Introduction, Terminology, Representation of Trees.

Binary Trees: Properties of Binary Trees, Binary Tree Representation, operations, Tree Traversals – recursive, non-recursive. Binary Search Tree and its operations.

UNIT – V: Self-Balanced Trees - AVL trees: Definition, Representation of an AVL Tree, Height of AVL tree, AVL element searching, insert and delete element from AVL tree.

Priority Queues: Heaps Definition, types of heaps, properties and its operations.

UNIT – VI: Graphs: Graph Definition, properties, Graph Representation, Elementary Graph Operations. Graph Traversal techniques: Depth First Search, Breadth First Search. Spanning Trees: Kruskal's Algorithm, Prims Algorithm. Single source shortest Paths and all pair shortest path algorithm.

3. 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.

4. 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, Rakesh Nayak, 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.

III Sem	DISCRETE MATHEMATICS	Course Code: V18CST03	L	T	P
			3	0	0

Syllabus Details

1. Course Outcomes: At the end of the Course student will be able to:

- CO1:** Demonstrate the concepts associated with propositions and mathematical logic. [K3]
CO2: Demonstrate the basic concepts associated with relations, functions and their applications. [K3]
CO3: Illustrate algebraic structures and their applications in computer science. [K3]
CO4: Apply techniques of graphs for real-time problems [K3]
CO5: Demonstrate the basic concepts associated with Number Theory [K3]
CO6: Solve recurrence relations using various methods and problems based on combinatorics. [K3]

2. Syllabus

UNIT-I Mathematical Logic: Statements and Notation, Connectives, Truth tables, Tautologies, Equivalence of formulas, Tautological Implications, Normal forms, Theory of inference for Statement Calculus, Indirect Method of Proof. Predicate calculus- Predicates, quantifiers, universe of discourse.

UNIT-II Set Theory and Relations: Basic concepts, Operations on Sets, Principle of Inclusion and Exclusion, Relations, Properties of Binary Relations in a set, Relation Matrix and Digraph, Equivalence, Partial Ordering Relations, Hasse Diagrams, Lattice and its Properties, Functions, Bijective Functions, Composition of Functions.

UNIT-III Algebraic Structures: Algebraic Systems and examples, Properties of Binary operations, Semi Groups, Monoids, Homomorphism of Semi groups and Monoids, Groups, Abelian Group, Subgroups.

UNIT-IV Graph Theory-I: Basic Concepts of graph, Representing graphs, Sub graphs, Isomorphic graphs, Paths and Circuits, Eulerian and Hamiltonian Graphs, Planar graphs, Graph Colouring, Chromatic Number.

UNIT-V Number Theory: Properties of integers, Division Theorem, The Greatest Common Divisor, Euclidean Algorithm, Least Common Multiple, Testing for Prime Numbers, The Fundamental Theorem of Arithmetic, Modular Arithmetic (Fermat's Theorem and Euler's Theorem)

UNIT-VI Combinatorics and Recurrence Relations:

Combinatorics: Basics of counting, permutations, combinations, inclusion-exclusion, pigeonhole principle.

Recurrence relations: Solving homogeneous and non-homogeneous recurrence relation by method of substitution, characteristic roots and generating function.

3. Text Books:

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

4. Reference Books:

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

III Sem	OBJECT ORIENTED PROGRAMMING FOR PROBLEM SOLVING	Course Code: V18CST04	L	T	P
			3	0	0

Syllabus Details

Course Outcomes: At the end of the Course student will be able to:

- CO1:** Differentiate Procedural Oriented Programming and Object Oriented Programming. [K2]
CO2: Develop object oriented programs on classes and objects. [K3]
CO3: Demonstrate various object-oriented concepts like Constructors, Destructors & Operator-Overloading. [K3]
CO4: Apply various Object Oriented features like Inheritance and Polymorphism to solve various computing Problems. [K3]
CO5: Develop programs to handle Exceptions & Files. [K3]
CO6: Describe Generic Programming. [K3]

1. Syllabus

UNIT I: Introduction to Object-Oriented Programming: Introduction to Object-Oriented Programming – Programming Paradigms, Features of Object Oriented Programming, Data Types, Variables, Constants, Operators, Decision Statements & Control Structures, Arrays, Namespace, Default Arguments, Constant Arguments, Inputting Default Arguments, Reference Arguments.

UNIT II: Classes and Objects: Introduction to Classes and Objects: Defining Classes & Objects, Access specifiers, Scope Resolution Operator, Static Member variables, Static Member Functions, Array of Objects, Inline Functions, Overloading Member Functions, Objects as Function Arguments, Friend Functions, Friend Class, Local Class, Empty Class, Nested Classes, Return by Reference.

UNIT III: Object Initialization, Cleanup and Operator Overloading: Introduction to Constructors, Characteristics, Constructor with Default Arguments, Parameterized Constructors, Overloading Constructors, Copy Constructor, Dynamic Constructors and Destructors, Anonymous Objects. Introduction to operator Overloading, Rules for Overloading Operators, Overloading Unary & Binary Operators, this keyword, Constraint on Increment and Decrement Operators, Overloading with Friend Functions, Type Conversions.

UNIT IV: Inheritance and Polymorphism: Base class and Derived class, Single Inheritance, Multiple Inheritance, Multilevel Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, and Constructor in Derived Classes. qualifier classes and inheritance, Significance of Virtual Functions, Early Vs Late Binding, Pure Virtual Functions, Virtual Destructor.

UNIT V: Exception Handling and File Handling: Principles of Exception Handling, Keywords, Exception Handling Mechanism, Multiple Catch Statements, Catching Multiple Exceptions, Re-throwing Exception. File Opening Modes, File Stream Classes, I/O manipulators, Classes for File Handling, Sequential Access Files, Random Access Files, Error Handling Functions.

UNIT-VI: Generic Programming with Templates: Need for Templates, Class Templates, Function Templates, overloading Template Functions. Introduction to Standard Template Library, Sequential Containers & Associative Containers.

3. 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.

4. References 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.

III Sem	DIGITAL ELECTRONICS LAB	Course	L	T	P
		Code:V18ECL04	0	0	3

Syllabus Details

1. **Course Outcomes:** After Completion of the Lab, Students will be able to

CO1: Apply the Boolean algebra to design digital logic circuits.

CO2: Analyse the behaviour of different combinational logic circuits.

CO3: Analyse the behaviour of different sequential logic circuits

CO4: Construct and troubleshoot simple combinational and sequential circuits

List of Experiments :*Conduct any TEN experiments*

Study of Integrated Circuits, Bread board & Power supplies.

- 1) Verification of Basic Logic Gates
- 2) Verification of Universal Gates, Special Gates.
- 3) Verify the De-Morgan laws using CMOS IC's
- 4) Design a Gray code encoder & Decoder using IC 7486
- 5) Construct a Half Adder using IC's and verify the truth table.
- 6) Construct a Half Subtractor using IC's and verify the truth table.
- 7) Verify the truth table of IC 74138 (3x8 Decoder)
- 8) Verify the truth table of IC 74153 (4x1 MUX).
- 9) Verify the D Flip-Flop Using IC 7474 with PRESET, CLEAR asynchronous Inputs.
- 10) Verify JK Flip-Flop & T Flip-Flop Using IC 7476 with PRESET, CLEAR asynchronous Inputs.
- 11) Verify Decade counter using IC 7490.
- 12) Design 4-bit right Shift Register using D-Flip-Flop and verify the truth table.

Add-on Experiments

- 13) Verify the read and write operations for the IC 74189.
- 14) Design the Mod-6 counter using IC 74XX

Equipment Required:

1. IC Trainer Kits
2. Electronic chips of all gates
3. Power Supplies
4. Bread boards

III Sem	DATA STRUCTURES AND ALGORITHMS LAB	Course Code: V18CSL02	L	T	P
			0	0	3

Syllabus Details

1. Course Outcomes:

After Completion of the Lab, Students will be able to

- CO1:** Construct Sorting and searching methods. [K3]
CO2: Implement programs using Singly Linked Lists, Double Linked List. [K3]
CO3: Construct Basic Data Structures, Stacks, Queues and Applications. [K3]
CO4: Implement various graph operations and shortest path algorithm. [K3]

List of Experiments

1. Programs to implement the following sorting techniques
 - (a) Selection sort
 - (b) Quick sort
 - (c) Merge sort
2. Programs to implement the following searching methods
 - (a) Linear search
 - (b) Binary search.
3. A Program to Implement hash table and its operations.(Note: Use at least one collision resolution technique)
4. A Program to implement addition of two polynomials. (using arrays).
5. A Program to implement single linked list and its operations. (create, insert, delete, display)
6. A Program to implement double linked list and its operations.
7. A Program to implement stack operations using arrays.
8. A Program to convert infix expression to postfix expression.
9. A Program to implement queue operations using single linked list.
10. A Program to implement circular queue using arrays.
11. A Program to implement Binary search Tree and its operations.
12. A Program to implement AVL trees and its operations.
13. A Program to implement Heap sort.
14. A Program to implement graph traversal algorithms (BFS & DFS).
15. A Program to implement minimum spanning tree algorithms (Prims & Krushkal)
16. A Program to implement single source shortest path algorithm.

3. 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.

4. 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, Rakesh Nayak, 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.

III Sem	OBJECT ORIENTED PROGRAMMING FOR PROBLEM SOLVING LAB	Course Code: V18CSL03	L	T	P
			0	0	3

Syllabus Details

Course Outcomes: At the end of the Course student will be able to:

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

2. Syllabus

1. Programs illustrating Various Control Structures.
2. Programs illustrating the use of following concepts.
 - (a) Default Arguments b) Constant Arguments c) Reference Arguments
3. Programs illustrating the use of following concepts:
 - a) Classes & Objects b) Inline functions
 - c) Static Member functions d) Overloading of Member Functions
4. Programs illustrating the use of following concepts.
 - a) Objects as Function Arguments b) Friend Functions , Friend class
 - c) Local class d) Empty Class& Nested Classes
5. Programs illustrating the use of following concepts.
 - a) Default constructor b) Constructor with arguments c) Copy constructor
6. Programs to illustrate the Overloading of various operators.
 - a) Binary b) Unary c) new d) delete
7. Programs illustrating the various forms of Inheritance.
 - a) Single b) Multilevel c) Hierarchical d) Hybrid
8. Program illustrating the use of Virtual Functions & Virtual Base class.
9. Programs illustrating how Exceptions are handled.
 - a) Division-by-zero b) Overflow in an array
10. Programs illustrating file handling operations:
 - a) Copying text files b) Displaying the contents of the file
11. Programs illustrating Class template and Overloading Function Template.
12. Programs illustrating Sequential Containers & Associative Containers.

3. 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.

IV Sem	COMPUTER ORGANIZATION	Course Code: V18CST05	L	T	P
			3	0	0

Syllabus Details

Course Outcomes: At the end of the Course student will be able to:

- CO1:** Illustrate Basic structure of Computers, Instruction types and their addressing modes. [K2]
CO2: Describe the different modes of Input / Output transfer. [K2]
CO3: Illustrate different types of Memory. [K2]
CO4: Describe the different types of Control Unit techniques. [K2]
CO5: Illustrate the Fixed point and Floating point arithmetic operations of ALU. [K2]
CO6: Explain the concept of Pipelining. [K2]

1. Syllabus

UNIT-I: Introduction: Functional Units, Basic Operational Concepts, Bus Structures.

Instruction Sequencing and Addressing Modes: Instructions and Instruction Sequencing, Addressing modes, Basic Input/Output Operations.

UNIT-II: Input/Output Organization: Accessing Input/Output devices, Interrupts- Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, Direct Memory Access, Buses- Synchronous and Asynchronous.

UNIT-III: Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative memory, Cache Memory. (Morris Mano)

UNIT-IV: Processing Unit: Fundamental Concepts, Execution of a Complete Instruction, Multiple-Bus Organization, Hardwired Control, Microprogrammed Control-Microinstructions, Microprogram Sequencing.

UNIT-V: Arithmetic Logic Unit: Introduction, Addition and Subtraction, Multiplication Algorithms, Division Algorithms, Floating-Point Arithmetic Operations. (Morris Mano)

UNIT-VI: Pipelining: Basic Concepts, Data Hazards, Instruction Hazards, Datapath and Control Considerations.

3. 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.

4. 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.

IV Sem	SOFTWARE ENGINEERING	Course Code: V18CST06	L	T	P
			3	0	0

Syllabus Details

1. Course Outcomes: At the end of the Course student will be able to:

- CO1:** Demonstrate Software Process Models. [K3]
CO2: Illustrate Requirement Engineering Process. [K3]
CO3: Discuss Software architecture and Design. [K2]
CO4: Apply Coding principles and Testing techniques. [K3]
CO5: Discuss Software Estimation and Maintenance. [K2]
CO6: Describe Quality Management and Metrics. [K2]

2. Syllabus

UNIT-I : The nature of Software: Defining Software, Software application Domains, Legacy software. Software engineering, the software process, software Myths.

Software development process models: Waterfall model, Prototyping, Iterative development, Unified process, Extreme programming and agile process. Merits and Demerits of Software Process Models.

UNIT-II: Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the Software requirements document .

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

UNIT-III: Software Architecture: Role of software architecture, Architecture views, components and connector view, architecture styles for C & C view, documenting architecture design, evaluating architectures.

Design: Design concepts, Function-oriented design, Object oriented design, Detailed design.

UNIT-IV: Coding and Testing: Programming principles and guidelines, incrementally developing code, managing evolving code. Testing concepts, testing process, Black-box testing, White-box testing.

Risk management: Reactive vs. Proactive Risk strategies, Software risks, Risk identification, Risk projection, Risk refinement, RMMM Plan.

UNIT-V: Software Project estimation: Decomposition techniques, Empirical Estimation Models.

Software Maintenance: Maintenance Process, Reverse Engineering, Reengineering, Configuration Management

UNIT-VI: Metrics for Process and Products: Software Measurement, Metrics for software quality.

Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, SEI-CMM Model, Six Sigma and ISO 9000 quality standards.

3. Text Books:

1. Software Engineering, A practitioner's Approach- Roger S.Pressman, 7th Edition, McGrawHill International Edition.
2. Software Engineering- Ian Sommerville, 9th Edition, Pearson education.
3. Software Engineering, A Precise approach, PankajJalote, Wiley

4. Reference Books:

1. CMMI and Six Sigma: Partners in Process Improvement , Jeannine M. Sivi, M. Lynn Penn, Robert W. Stoddard, 1st edition, Addison Wesley;
2. Software Engineering principles and practice, W S Jawadekar, 3rd Edition, TMH

IV Sem	FORMAL LANGUAGES AND AUTOMATA THEORY	Course Code: V18CST07	L	T	P
			3	0	0

Syllabus Details

1. Course Outcomes: At the end of the Course student will be able to:

- CO1:** Construct DFA, NFA and ϵ -NFA. [K3]
CO2: Produce Regular expressions, Regular Grammars. [K3]
CO3: Construct Context Free Grammars, Context Free Languages. [K3]
CO4: Construct Pushdown Automata and its equivalence with CFG.[K3]
CO5: Construct Turing machine. [K3]
CO6: Discuss Decidability Theory. [K2]

2. Syllabus

UNIT-I: Alphabet, Strings, Language, Finite Automaton Definition, Transition Systems, Acceptance of Strings by Finite Automata, DFA, Design of DFA, NFA, Design of NFA, Equivalence between NFA and DFA, Finite Automata with ϵ -Transition, Equivalence between NFA and ϵ -NFA, Minimization of Finite Automata, Equivalence between two Finite Automata, Moore and Mealy machines and their equivalences, Applications of Finite Automata.

UNIT-II: REGULAR EXPRESSIONS: Regular expressions, Identity rules, Equivalence between two Regular Expressions, Equivalence between Regular Expressions and Finite Automata, Pumping lemma, Closure properties of regular sets(proofs not required),Regular Sets and Regular grammars, Equivalence between Regular grammar and FA, Regular Expressions and Regular Grammar.

UNIT-III: CONTEXT FREE GRAMMARS: Formal Languages, Grammars, Classification of Grammars, Chomsky Hierarchy, Context free Grammars, Derivation of string, Left Most Derivations, Right Most Derivations, parse trees, Ambiguity in Context-Free Grammars, Simplification of Context Free Grammars, Normal Forms- Chomsky Normal Form (CNF), Greibach Normal Form (GNF),Pumping Lemma, Closure Properties, Applications of Context Free Languages.

UNIT-IV: PUSHDOWN AUTOMATA: Definitions, Instantaneous descriptions, Languages of a PDA, Equivalence of Pushdown automata and CFG's, Deterministic pushdown automata: Definition DPDA, Regular Languages and DPDA , DPDA and context free languages.

UNIT-V: TURING MACHINE: Definition, Model, Representation of Turing Machines: Instantaneous Description, Transition Tables and Transition Diagrams, Language Acceptance of a Turing Machine, Design of Turing Machine (TM) , Types of TM's (Proofs not required).

UNIT-VI: Recursive languages, Recursive Enumerable Language, Closure Properties of Recursive languages & Recursive Enumerable, Universal Turing Machine. Decidable and Un-decidable Languages, Halting Problem of Turing Machines, Post Correspondence Problem, Modified Post's Correspondence Problem.

3. Text Books:

1. Introduction to Automata Theory, Languages and Computation, J.E.Hopcroft, R.MotwaniandJ.D.Ullman, 3rd Edition, Pearson, 2008.
2. Theory of Computer Science-Automata ,Languages and Computation, K.L.P.Mishra and N.Chandrasekharan, 3rd Edition,PHI, 2007.
3. Peter Linz, "An Introduction to Formal Language and Automata", ThirdEdition, Narosa Publishers, New Delhi, 2002

4. Reference Books:

- 1.Introduction to Automata Theory, Formal Languages and Computation, ShyamalenduKandar, Pearson, 2013.
2. Theory of Computation, V.Kulkarni, Oxford UniversityPress, 2013.
3. Theory of Automata, Languages and Computation, RajendraKumar, McGraw Hill, 2014.
4. Formal Language and Automata Theory, K.V.N.Sunitha and N.Kalyani, Pearson, 2015.
5. John C Martin, "Introduction to Languages and the Theory of Computation", Third Edition, Tata McGraw Hill Publishing Company, New Delhi, 2007
6. Kamala Krithivasan and Rama. R, "Introduction to Formal Languages, Automata Theory and Computation", Pearson Education 2009.

IV Sem	JAVA PROGRAMMING	Course Code: V18CST08	L	T	P
			3	0	0

Syllabus Details

Course Outcomes: At the end of the Course student will be able to:

- CO1:** Describe Java Virtual Machine and Type casting. [K2]
CO2: Demonstrate Concepts like Constructors, Arrays, Nested Classes and Command Line Arguments. [K3]
CO3: Implement Concepts of Inheritance and Exception Handling [K3]
CO4: Develop programs on Multi-Threading and Files [K3]
CO5: Demonstrate Applet Programming and AWT Components. [K3]
CO6: Describe Event Handling and Swings. [K3]

2. Syllabus

UNIT-I: Introduction to Java: Introduction to Object Oriented Paradigm, Concepts of OOP, Applications of OOP, History of Java, Java Features, JVM, Program Structure. Variables, Primitive Data Types, Constants, Operators, Expressions, Precedence rules and Associativity, Primitive type conversion and Casting, Control Structures.

UNIT-II: Classes and Objects: Classes and objects, Class declaration, Creating objects, Methods, Constructors and Constructor Overloading, Importance of Static Keyword and Examples, this Keyword, Arrays, Command Line Arguments, Nested Classes.

UNIT-III: Inheritance and Exception Handling: Inheritance, super Keyword, final Keyword, Method Overriding and Abstract Class. Interfaces, Creating Packages, Using Packages, Importance of Class path. Exception Handling, Importance of try, catch, throw, throws and finally Block.

UNIT-IV: Multithreading and Files: Introduction, Thread Lifecycle, Creation of Threads, Thread Priorities, Thread Synchronization, Communication between Threads. Reading Data from Files and Writing Data to Files, Random Access Files.

UNIT-V: Applet Programming and AWT: Applet Class, Applet Lifecycle, Applet Programs. Introduction to AWT, Components and Containers, Button, Label, Checkbox, Radio Buttons, List Boxes, Layouts, Menu and Scrollbar.

UNIT-VI: Event Handling and Swings: Event Handling : Event Delegation Model, Sources of Events, Event Listeners, Adapter Classes, InnerClasses. Introduction to Swings.

3. Text Books:

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

4. Reference books:

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

IV Sem	PYTHON PROGRAMMING	Course Code:	L	T	P
		V18CST09	3	0	0

Syllabus Details

Course Outcomes: At the end of the Course student will be able to:

- CO1:** Illustrate basic concepts of Python Programming. [K2]
CO2: Describe control structures in python. [K2]
CO3: Demonstrate functions and packages. [K3]
CO4: Construct python programs using structured data types. [K3]
CO5: Compare TextFiles and Binary Files. [K4]
CO6: Apply OOPs concepts to Develop Test cases. [K3]

2. Syllabus

UNIT-I: Introduction to Python, Data Types & Operators: Basics of python programming: Features of python – History of Python - The Future of Python installation and execution - Data types – Identifiers - variables – type conversions- Literal Constants – Numbers – Strings. I/O statements. Operators and expressions, operator precedence – expression evaluation.

UNIT-II: Control Structures: Decision Control statements: conditional (if), alternative (if-else), chained conditional (if-elif-else);

Iteration: while loop, for loop, nested for loop, range function, break, continue and pass statements.

UNIT-III: Functions :Functions & modules : Introduction - Function Declaration & Definition - Function Call – Variable Scope and Lifetime - The return statement-More on Defining Functions - Lambda Functions or Anonymous Functions - Documentation Strings- Modules – Packages.

UNIT-IV: Structured Data Types: Lists: list operations, list slices, list methods, cloning lists, list parameters. **Tuples:** tuple assignment, tuple as return value. **Set:** Set Creation, Set Operations. **Dictionaries:** Creation, operations; comprehension, operations on strings.

UNIT-V: Files & Exception Handling: Introduction - Types of files - Text files - reading and writing files; Errors and exceptions handling.

UNIT-VI: OOPS concepts and Testing Basics: Classes, Methods, Constructor, Inheritance, Overriding Methods, Data hiding, GUI programming with TKINTER.

3. Text Books:

1. “Python Programming using problem solving Approach” ReemaThareja, Oxford University Press – 2017.
2. Python with Machine Learning by A.Krishna Mohan, Karunakar & T.Murali Mohan by S. Chand Publisher-2018.

4. Reference Books:

1. Allen B. Downey, “Think Python: How to Think Like a Computer Scientist“, 2nd edition, Updated for Python 3, Shroff/O’Reilly Publishers, 2016 .
2. Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.
3. John V Guttag, —Introduction to Computation and Programming Using Python“, Revised and expanded Edition, MIT Press , 2013
4. Robert Sedgewick, Kevin Wayne, Robert Dondero, —Introduction to Programming in Python:

IV Sem	JAVA PROGRAMMING LAB	Course Code: V18CSL04	L	T	P
			3	0	0

Syllabus Details

Course Outcomes: At the end of the Course student will be able to:

CO1: Develop Programs on Classes and Objects, Constructors, Arrays.(K3)

CO2: Demonstrate Inheritance and Exception Handling.(K3)

CO3: Develop programs on Multi Threading and Files. (K3)

CO4: Demonstrate GUI Programming using Applets and Swings. (K3)

1. Syllabus

1. Programs illustrating Control Structures and Type Conversions in java.
2. Programs illustrating the use of following concepts:
 - a) Classes & Objects
 - b) Usage of static
 - c) Constructors
3. Programs illustrating the use of following concepts.
 - a) Arrays
 - b) Nested Classes
 - c) Command Line Arguments
4. Programs illustrating the use of following concepts.
 - a) Inheritance
 - b) Usage of super
 - c) Method Overriding
5. Programs to illustrate the Overloading of various operators.
 - a) Usage of final
 - b) Abstract class
 - c) Interfaces
6. Programs illustrating the various concepts like.
 - a) Packages
 - b) Exception Handling.
7. Programs illustrating how Multi-Threading implemented.
 - a) Multiple Threads on Single Object
 - b) Thread Deadlock
8. Programs illustrating Thread Communication.
9. Programs illustrating reading from and writing to files.
 - a) Sequential Files
 - b) Random Access Files
10. Programs illustrating GUI using Applets & AWT Components.
11. Programs to illustrate Event Handling using Listener Interfaces.
12. Programs illustrating GUI using Swings.

3. Text books:

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

IV Sem	PYTHON PROGRAMMING LAB	Course Code: V18CSL05	L	T	P
			0	0	3

Syllabus Details

Course Outcomes: At the end of the Course student will be able to:

CO1: Demonstrate Basic Python Programs	[K3]
CO2: Construct control structures in python	[K3]
CO3: Demonstrate functions and packages.	[K3]
CO4: Construct python programs using structured data types.	[K3]
CO5: Demonstrate Text Files and exception handling.	[K3]
CO6: Test Rock – paper – Scissors game.	[K4]

2. Syllabus

Exercise 1 - Basics

- A sample Python Script using command prompt, Python Command Line and IDLE
- A program to purposefully raise an Indentation Error and correct it

Exercise 2 - Operations

- A program to compute distance between two points taking input from the user (Pythagorean Theorem)
- A program on add.py that takes 2 numbers as command line arguments and prints its sum.

Exercise - 3 Control Flow

- A Program to implement for checking whether the given number is a even number or not.
- A program to construct reverse the digits of a given number and add it to the original, If the sum is not a palindrome repeat this procedure.
- A program using a while loop that asks the user for a number, and prints a countdown from that number to zero.

Exercise 4 - Control Flow – Continued

- A program to construct the following pattern, using a nested for loop.

```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```

- By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.

Exercise - 5 – Problem Solving using Functions

- Find mean, median, mode for the given set of numbers passed as arguments to a function
- Develop a function nearly_equal to test whether two strings are nearly equal. Two strings a and b are nearly equal when a can be generated by a single mutation on b.
- Develop a Recursive Function to find the Factorial of a given number.
- Develop function to compute gcd, lcm of two numbers. Each function shouldn't exceed one line.

Exercise - 6 Structured Data types

- a) a program to count the number of strings where the string length is 2 or more and the first and last character are same from a given list of strings.
- b) a program to develop unzip a list of tuples into individual lists and convert them into dictionary.

Exercise – 7 Structured Data types Continued

- a) A program to count the numbers of characters in the string and store them in a dictionary data structure
- b) A program to use split and join methods in the string and trace a birthday with a dictionary data structure.

Exercise - 8– Modules

- a) Install packages requests, flask and explore them using (pip)
- b) A program to implement a script that imports requests and fetch content from the page. Eg. (Wiki)
- c) Develop a simple script that serves a simple HTTPResponse and a simple HTML Page

Exercise - 9 Files

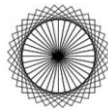
- a) A program to count frequency of characters in a given file. Can you use character frequency to tell whether the given file is a Python program file, C program file or a text file?
- b) A program to compute the number of characters, words and lines in a file.

Exercise - 10 OOP

- a) Class variables and instance variable and illustration of self variable
 - i) Robot
 - ii) ATM Machine

Exercise - 11 GUI, Graphics

1. Develop a GUI for an Expression
2. A program to implement the following figures using turtle



Case Study: Implement Rock – paper – Scissors game using TKINTER.

Text Books:

1. “Python Programming using problem solving Approach” ReemaThareja, Oxford University Press – 2017.
2. Python with Machine Learning by A.Krishna Mohan, Karunakar & T.Murali Mohan by S. Chand Publisher-2018.

III Sem	DATA STRUCTURES & ALGORITHMS LAB	Course Code: V18CSL31	L	T	P	C
			2	0	2	2
Branch	EEE					

Syllabus Details

Course Outcomes: At the end of the Course student will be able to:

- CO1:** Construct Sorting and searching methods. (K3)
- CO2:** Implement programs using Singly Linked Lists, Double Linked List. (K3)
- CO3:** Construct Basic Data Structures, Stacks, Queues and Applications. (K3)
- CO4:** construct Binary search tree (K3)
- CO5:** Implement various graph operations and shortest path algorithm. (K3)

List of Experiments

1. Bubble sort, Insertion sort, Selection sort, Quick sort, Merge sort.

Programs to implement the following sorting techniques

- a) Selection sort b) Quick sort c) Merge sort

2. Linear search and Binary search.

Programs to implement the following searching methods

- a) Linear search b) Binary search.

3. Basic Terminology, Classification of Data Structures, Operation on Data Structures. **Arrays:** Representation of arrays - Polynomial representation, Addition of two polynomials.

A Program to implement addition of two polynomials. (using arrays).

4. single linked list Representation of node, operations on single linked list,
A Program to implement single linked list and its operations. (create, insert, delete, display, reverse list)

5. **Double linked list:** operations like insert delete and display.

A Program to implement double linked list and its operations.

6. **Stacks:** Introduction, Array representation, Operations, linked list representation, operation on linked stacks

A Program to implement stack operations using arrays.

7. **Queues:** Introduction, Array representation, linked list representation, operation on queues, types of queues

A Program to implement queue operations using arrays.

8. Applications of Stacks

A Program to convert infix expression to postfix expression.

9. Introduction, Terminology, Representation of Trees, types of trees, **Binary Trees:** Properties of Binary Trees, Tree Traversals. **Binary Search Tree:** Introduction, Creation, insertion, delete, display.

A Program to implement Binary search Tree and its operations.

10. **Graphs:** Introduction, Terminology, **Graph Traversal techniques:** Depth First Search, Breadth First Search

A Program to implement graph traversal algorithms (BFS & DFS).

Text Books:

1. Data Structures, algorithms and applications in C++, Sartaj Sahni, Universities press, Second Edition.
2. Fundamentals of Data Structures in C++, Ellis Horowitz, Sartaj Sahni 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, Rakesh Nayak, 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.

IV Sem	PYTHON PROGRAMMING LAB	Course Code: V18CSL33	L	T	P	C
			0	0	2	1

Syllabus Details

Course Outcomes: At the end of the Course student will be able to:

- CO1:** Demonstrate Basic Python Programs (K3)
- CO2:** Construct control structures in python (K3)
- CO3:** Demonstrate functions and packages. (K3)
- CO4:** Construct python programs using structured data types. (K3)
- CO5:** Demonstrate TextFiles (K3)

2. Syllabus

Basics of python programming: Features of python – History of Python - The Future of Python installation and execution - Data types – Identifiers - variables – type conversions- Literal Constants – Numbers – Strings. I/O statements. Operators and expressions, operator precedence – expression evaluation.

Exercise 1 - Basics

- a) A sample Python Script using command prompt, Python Command Line and IDLE
- b) A program to purposefully raise an Indentation Error and correct it

Exercise 2 - Operations

- a) A program to compute distance between two points taking input from the user (Pythagorean Theorem)
- b) A program on add.py that takes 2 numbers as command line arguments and prints its sum.

Decision Control statements: conditional (if), alternative (if-else), chained conditional (if-elif-else); **Iteration:** while loop, for loop, nested for loop, range function, break, continue and pass statements.

Exercise - 3 Control Flow

- a) A Program to implement for checking whether the given number is a even number or not.
- b) A program to construct reverse the digits of a given number and add it to the original, If the sum is not a palindrome repeat this procedure.
- c) A program using a while loop that asks the user for a number, and prints a countdown from that number to zero.

Exercise 4 - Control Flow – Continued

- a) A program to construct the following pattern, using a nested for loop.

```
*
**
***
****
*****
****
***
**
*
```

- b) By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.

Functions and modules : Introduction - Function Definition - Function Call – argument types- Scope and Lifetime - The return statement - More on Defining Functions - Lambda Functions or Anonymous Functions.

Exercise - 5 – Problem Solving using Functions

- a) Find mean, median, mode for the given set of numbers passed as arguments to a function

- b) Develop a function `nearly_equal` to test whether two strings are nearly equal. Two strings `a` and `b` are nearly equal when `a` can be generated by a single mutation on `b`.
- c) Develop a Recursive Function to find the Factorial of a given number .
- d) Develop function to compute gcd, lcm of two numbers. Each function shouldn't exceed one line.

Lists: list operations, list slices, list methods, mutability, cloning lists, list parameters. **Tuples:** tuple assignment, tuple as return value. **Set:** Set Creation, Set Operations. **Dictionaries:** Creation, operations; comprehension, operations on strings.

Exercise - 6 Structured Data types

- a) a program to count the number of strings where the string length is 2 or more and the first and last character are same from a given list of strings.
- b) a program to develop `unzip` a list of tuples into individual lists and convert them into dictionary.

Exercise – 7 Structured Data types Continued

- a) A program to count the numbers of characters in the string and store them in a dictionary data structure
- b) a program to use `split` and `join` methods in the string and trace a birthday with a dictionary data structure.

Documentation Strings- Modules – Packages

Exercise - 8– Modules

- a) Install packages `requests`, `flask` and explore them using (`pip`)
- b) A program to implement a script that imports `requests` and fetch content from the page. Eg. (Wiki)
- c) Develop a simple script that serves a simple HTTP Response and a simple HTML Page

Introduction - Types of files - Text files - reading and writing files

Exercise - 9 Files

- a) a program to count frequency of characters in a given file. Can you use character frequency to tell whether the given file is a Python program file, C program file or a text file?
- b) a program to compute the number of characters, words and lines in a file.

Classes, Methods, Constructor, Inheritance, Overriding Methods, Data hiding

Exercise - 10 OOP

- a) Class variables and instance variable and illustration of `self` variable
 - i) Robot
 - ii) ATM Machine

Text Books:

1. “Python Programming using problem solving Approach” ReemaThareja, Oxford University Press – 2017.
2. Python with Machine Learning by A.Krishna Mohan, Karunakar & T.Murali Mohan by S. Chand Publisher-2018.

IV Sem	OBJECT-ORIENTED PROGRAMMING THROUGH JAVA LAB	Course Code: V18CSL32	L	T	P	C
			0	0	2	1
Branch	ECE					

Syllabus Details

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

- CO1:** Use code editors and JDK tools to write, compile, and run Java programs.
- CO2:** Use control statements and arrays while programming.
- CO3:** Develop programs using classes and objects.
- CO4:** Use inheritance, interfaces and packages while developing programs in Java.
- CO5:** Apply exception-handling mechanism.
- CO6:** Develop multithreaded programs.

Syllabus:

CYCLE-I: Overview of Object-oriented Programming: Introduction to Object-oriented Programming, Principles of Object-oriented Programming Languages, and Applications of OOP.

Introduction to Java: History of Java, Java Features, Java Virtual Machine, Java Program Structure, Literals, Identifiers, Primitive Data types, Variables, Operators and Expressions, Operator Precedence and Associativity, Type Conversion and Casting.

Exercises

- a) Develop a Java program to display the default values of all primitive data types of Java.
- b) Construct a Java program that calculates the area of a triangle, given the lengths of all three sides.
Area = $\sqrt{S(S-a)(S-b)(S-c)}$, where $S = (a+b+c)/2$.

CYCLE- II: Control Statements: Conditional Statements - if, switch; Iteration Statements - while, do-while, for, for-each version of for; Jump Statements - break, continue, return.

Arrays: Introduction to Arrays, Array Declaration and Initialization, One-Dimensional Arrays, Multi-Dimensional Arrays, Basic String Handling.

Exercises

- a) Develop a Java program that displays
 - i) The roots of a quadratic equation $ax^2+bx+c=0$
 - ii) The nature of roots by calculating the discriminant D.
- b) N bikers compete in a race such that they drive at a constant speed, which may or may not be the same as the other. To qualify the race, the speed of a racer must be more than the average speed of all N racers. Take as input, the speed of each racer and print back the speed of qualifying racers.
- c) Develop a Java program that displays the name of the day, based on the value of day, using the switch statement.
- d) Develop a Java program to search for an element in a given list of elements using Linear Search.
- e) Develop a Java program to perform multiplication of two matrices.
- f) Develop a Java program using StringBuffer to perform various operations on a string.

CYCLE- III: Introduction to Classes and Objects: General Form of a Class, Methods, Declaring Objects using new, Constructors, this Keyword, Understanding static, Method and Constructor Overloading, Using Command-Line Arguments, Garbage Collection.

Exercises

- a) Construct a Java program to demonstrate class mechanism - Create a class that contains variables, methods, constructors and invoke those methods inside main().

- b) Develop a Java program demonstrating the use of static variables, methods.
- c) Develop a Java program demonstrating the use of this keyword.
- d) Develop a Java program that implements method overloading.
- e) Develop a Java program that implements constructor overloading.
- f) Develop a Java program demonstrating the use of command-line arguments.

CYCLE– IV: Inheritance: Access Control, Introduction to Inheritance, Types of Inheritance, Using super, Method Overriding and Dynamic Method Dispatch, Using final, Abstract Classes.

Interfaces: Defining and Implementing Interfaces. **Packages:** Creating Packages, Importing Packages, Importance of CLASSPATH.

Exercises

- a) Construct a Java program to demonstrate single inheritance.
- b) Construct a Java program to demonstrate multi-level inheritance.
- c) Construct a Java program that illustrates the use of super.
- d) Develop a Java program that illustrates runtime polymorphism.
- e) Develop a Java program that uses an abstract class to find areas of different shapes.
- f) Develop a Java program using interfaces. In addition, use interfaces to achieve multiple inheritance.
- g) Construct a Java program that creates a user-defined package. Use the package by importing it in another Java program.

CYCLE– V: Exception Handling: Exception-Handling Fundamentals, Using try and catch, Using throw, Using throws and finally, User-defined Exceptions.

Exercises

- a) Develop a Java program to demonstrate exception-handling mechanism using try/catch. Use multiple catch clauses.
- b) Construct a Java program for illustrating the use of throw.
- c) Construct a Java program for illustrating the use of finally.
- d) Construct a java program for demonstrating the creation and use of user-defined exceptions.

CYCLE– VI: Multithreading: Introduction to Multithreading, Creation of Threads, Thread Life Cycle, isAlive() and join(), Thread Synchronization, and Inter-thread Communication.

Exercises

- a) Construct a Java program that creates threads by extending Thread class. The first thread displays “Good Morning” every 1 second, the second thread displays “Hello” every 2 seconds and the third displays “Welcome” every 3 seconds.
- b) Use Runnable to develop a Java program for the above problem.
- c) Construct a java program illustrating isAlive() and join().
- d) Develop a Java program to solve producer consumer problem using thread synchronization.

TEXT BOOKS:

1. Java: The Complete Reference; 8th edition; Herbert Schildt; TMH.
2. Programming in Java; 2nd edition; SachinMalhotra, SaurabhChoudhary; Oxford University Press.
3. Core JAVA, An Integrated Approach; Dr. R. Nageswara Rao; Dreamtech Press.

III Sem	DATA STRUCTURES & ALGORITHMS LAB	Course Code:	L	T	P	C
		V18CSL31	2	0	2	2
Branch	EEE					

Syllabus Details

Course Outcomes:

- CO1:** Construct Sorting and searching methods. (K3)
- CO2:** Implement programs using Singly Linked Lists, Double Linked List. (K3)
- CO3:** Construct Basic Data Structures, Stacks, Queues and Applications. (K3)
- CO4:** construct Binary search tree (K3)
- CO5:** Implement various graph operations and shortest path algorithm. (K3)

List of Experiments

1. Bubble sort, Insertion sort, Selection sort, Quick sort, Merge sort.

Programs to implement the following sorting techniques

- a) Selection sort b) Quick sort c) Merge sort

2. Linear search and Binary search.

Programs to implement the following searching methods

- a) Linear search b) Binary search.

3. Basic Terminology, Classification of Data Structures, Operation on Data Structures. **Arrays:** Representation of arrays - Polynomial representation, Addition of two polynomials.

A Program to implement addition of two polynomials. (using arrays).

4. single linked list Representation of node, operations on single linked list,
A Program to implement single linked list and its operations. (create, insert, delete, display, reverse list)

5. **Double linked list:** operations like insert delete and display.

A Program to implement double linked list and its operations.

6. **Stacks:** Introduction, Array representation, Operations, linked list representation, operation on linked stacks

A Program to implement stack operations using arrays.

7. **Queues:** Introduction, Array representation, linked list representation, operation on queues, types of queues

A Program to implement queue operations using arrays.

8. Applications of Stacks

A Program to convert infix expression to postfix expression.

9. Introduction, Terminology, Representation of Trees, types of trees, **Binary Trees:** Properties of Binary Trees, Tree Traversals. **Binary Search Tree:** Introduction, Creation, insertion, delete, display.

A Program to implement Binary search Tree and its operations.

10. **Graphs:** Introduction, Terminology, **Graph Traversal techniques:** Depth First Search, Breadth First Search

A Program to implement graph traversal algorithms (BFS & DFS).

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, Rakesh Nayak, 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.

IV Sem	PYTHON PROGRAMMING LAB	Course Code:	L	T	P	C
		V18CSL33	0	0	2	1
Branch	EEE					

Syllabus Details

1. Course Outcomes: Upon completion of the course, students will be able to

- CO1:** Demonstrate Basic Python Programs (K3)
- CO2:** Construct control structures in python (K3)
- CO3:** Demonstrate functions and packages. (K3)
- CO4:** Construct python programs using structured data types. (K3)
- CO5:** Demonstrate TextFiles (K3)

2. Syllabus

Basics of python programming: Features of python – History of Python - The Future of Python installation and execution - Data types – Identifiers - variables – type conversions- Literal Constants – Numbers – Strings. I/O statements. Operators and expressions, operator precedence – expression evaluation.

Exercise 1 - Basics

- a) A sample Python Script using command prompt, Python Command Line and IDLE
- b) A program to purposefully raise an Indentation Error and correct it

Exercise 2 - Operations

- a) A program to compute distance between two points taking input from the user (Pythagorean Theorem)
- b) A program on add.py that takes 2 numbers as command line arguments and prints its sum.

Decision Control statements: conditional (if), alternative (if-else), chained conditional (if-elif-else); **Iteration:** while loop, for loop, nested for loop, range function, break, continue and pass statements.

Exercise - 3 Control Flow

- a) A Program to implement for checking whether the given number is a even number or not.
- b) A program to construct reverse the digits of a given number and add it to the original, If the sum is not a palindrome repeat this procedure.
- c) A program using a while loop that asks the user for a number, and prints a countdown from that number to zero.

Exercise 4 - Control Flow – Continued

- a) A program to construct the following pattern, using a nested for loop.

```
*
**
***
****
*****
****
***
**
*
```

- b) By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.

Functions and modules : Introduction - Function Definition - Function Call – argument types- Scope and Lifetime - The return statement - More on Defining Functions - Lambda Functions or Anonymous Functions.

Exercise - 5 – Problem Solving using Functions

- a) Find mean, median, mode for the given set of numbers passed as arguments to a function
- b) Develop a function nearly_equal to test whether two strings are nearly equal. Two strings a and b are nearly equal when a can be generated by a single mutation on b.

- c) Develop a Recursive Function to find the Factorial of a given number .
- d) Develop function to compute gcd, lcm of two numbers. Each function shouldn't exceed one line.

Lists: list operations, list slices, list methods, mutability, cloning lists, list parameters. **Tuples:** tuple assignment, tuple as return value. **Set:** Set Creation, Set Operations. **Dictionaries:** Creation, operations; comprehension, operations on strings.

Exercise - 6 Structured Data types

- a) a program to count the number of strings where the string length is 2 or more and the first and last character are same from a given list of strings.
- b) a program to develop unzip a list of tuples into individual lists and convert them into dictionary.

Exercise – 7 Structured Data types Continued

- a) A program to count the numbers of characters in the string and store them in a dictionary data structure
- b) a program to use split and join methods in the string and trace a birthday with a dictionary data structure.

Documentation Strings- Modules – Packages

Exercise - 8– Modules

- a) Install packages requests, flask and explore them using (pip)
- b) A program to implement a script that imports requests and fetch content from the page. Eg. (Wiki)
- c) Develop a simple script that serves a simple HTTP Response and a simple HTML Page

Introduction - Types of files - Text files - reading and writing files

Exercise - 9 Files

- a) a program to count frequency of characters in a given file. Can you use character frequency to tell whether the given file is a Python program file, C program file or a text file?
- b) a program to compute the number of characters, words and lines in a file.

Classes, Methods, Constructor, Inheritance, Overriding Methods, Data hiding

Exercise - 10 OOP

- a) Class variables and instance variable and illustration of self variable
 - i) Robot
 - ii) ATM Machine

Text Books:

1. “Python Programming using problem solving Approach” ReemaThareja, Oxford University Press – 2017.
2. Python with Machine Learning by A.Krishna Mohan, Karunakar&T.Murali Mohan by S. Chand Publisher- 2018.

IV Sem	OBJECT-ORIENTED PROGRAMMING THROUGH JAVA LAB	Course Code: V18CSL32	L	T	P	C
			0	0	2	1
Branch	ECE					

Syllabus Details

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

- CO1:** Use code editors and JDK tools to write, compile, and run Java programs.
- CO2:** Use control statements and arrays while programming.
- CO3:** Develop programs using classes and objects.
- CO4:** Use inheritance, interfaces and packages while developing programs in Java.
- CO5:** Apply exception-handling mechanism.
- CO6:** Develop multithreaded programs.

Syllabus:

CYCLE-I: Overview of Object-oriented Programming: Introduction to Object-oriented Programming, Principles of Object-oriented Programming Languages, and Applications of OOP.

Introduction to Java: History of Java, Java Features, Java Virtual Machine, Java Program Structure, Literals, Identifiers, Primitive Data types, Variables, Operators and Expressions, Operator Precedence and Associativity, Type Conversion and Casting.

Exercises

- a) Develop a Java program to display the default values of all primitive data types of Java.
- b) Construct a Java program that calculates the area of a triangle, given the lengths of all three sides.
Area = $\sqrt{S(S-a)(S-b)(S-c)}$, where $S = (a+b+c)/2$.

CYCLE- II: Control Statements: Conditional Statements - if, switch; Iteration Statements - while, do-while, for, for-each version of for; Jump Statements - break, continue, return.

Arrays: Introduction to Arrays, Array Declaration and Initialization, One-Dimensional Arrays, Multi-Dimensional Arrays, Basic String Handling.

Exercises

- a) Develop a Java program that displays
 - i) The roots of a quadratic equation $ax^2+bx+c=0$
 - ii) The nature of roots by calculating the discriminate D.
- b) N bikers compete in a race such that they drive at a constant speed, which may or may not be the same as the other. To qualify the race, the speed of a racer must be more than the average speed of all N racers. Take as input, the speed of each racer and print back the speed of qualifying racers.
- c) Develop a Java program that displays the name of the day, based on the value of day, using the switch statement.
- d) Develop a Java program to search for an element in a given list of elements using Linear Search.
- e) Develop a Java program to perform multiplication of two matrices.
- f) Develop a Java program using StringBuffer to perform various operations on a string.

CYCLE- III: Introduction to Classes and Objects: General Form of a Class, Methods, Declaring Objects using new, Constructors, this Keyword, Understanding static, Method and Constructor Overloading, Using Command-Line Arguments, Garbage Collection.

Exercises

- a) Construct a Java program to demonstrate class mechanism - Create a class that contains variables, methods, constructors and invoke those methods inside main().
- b) Develop a Java program demonstrating the use of static variables, methods.
- c) Develop a Java program demonstrating the use of this keyword.

- d) Develop a Java program that implements method overloading.
- e) Develop a Java program that implements constructor overloading.
- f) Develop a Java program demonstrating the use of command-line arguments.

CYCLE– IV:Inheritance: Access Control, Introduction to Inheritance, Types of Inheritance, Using super, Method Overriding and Dynamic Method Dispatch, Using final, Abstract Classes.

Interfaces: Defining and Implementing Interfaces.**Packages:** Creating Packages, Importing Packages, Importance of CLASSPATH.

Exercises

- a) Construct a Java program to demonstrate single inheritance.
- b) Construct a Java program to demonstrate multi-level inheritance.
- c) Construct a Java program that illustrates the use of super.
- d) Develop a Java program that illustrates runtime polymorphism.
- e) Develop a Java program that uses an abstract class to find areas of different shapes.
- f) Develop a Java program using interfaces. In addition, use interfaces to achieve multiple inheritance.
- g) Construct a Java program that creates a user-defined package. Use the package by importing it in another Java program.

CYCLE– V: Exception Handling: Exception-Handling Fundamentals, Using try and catch, Using throw, Using throws and finally, User-defined Exceptions.

Exercises

- a) Develop a Java program to demonstrate exception-handling mechanism using try/catch. Use multiple catch clauses.
- b) Construct a Java program for illustrating the use of throw.
- c) Construct a Java program for illustrating the use of finally.
- d) Construct a java program for demonstrating the creation and use of user-defined exceptions.

CYCLE– VI:Multithreading: Introduction to Multithreading, Creation of Threads, Thread Life Cycle, isAlive() and join(), Thread Synchronization, and Interthread Communication.

Exercises

- a) Construct a Java program that creates threads by extending Thread class. The first thread displays “Good Morning” every 1 second, the second thread displays “Hello” every 2 seconds and the third displays “Welcome” every 3 seconds.
- b) Use Runnable to develop a Java program for the above problem.
- c) Construct a java program illustrating isAlive() and join().
- d) Develop a Java program to solve producer consumer problem using thread synchronization.

TEXT BOOKS:

1. Java: The Complete Reference; 8th edition; Herbert Schildt; TMH.
2. Programming in Java; 2nd edition; Sachin Malhotra, Saurabh Choudhary; Oxford University Press.
3. Core JAVA, An Integrated Approach; Dr. R. Nageswara Rao; Dreamtech Press.

Annexure-V

II Sem	Deep Learning	Course Code:	L	T	P
		V18CTT19	3	0	0

Syllabus Details

Course Outcomes: At the end of the Course student will be able to:

- CO1: Explain the concept of Neural Networks (K2)
- CO2: Explain about Feed forward Networks (K2)
- CO3: Explain the fundamentals of Deep Neural Networks (K2)
- CO4: Explain about Recurrent Neural Networks (K2)
- CO5: Explain Convolutional Neural Networks (K2)

Syllabus:

Unit I-Basics: Biological Neuron, Idea of computational units, McCulloch–Pitts unit and Thresholding logic, Linear Perceptron, Perceptron Learning Algorithm, Linear separability. Convergence theorem for Perceptron Learning Algorithm.

Unit-II Feedforward Networks: Multilayer Perceptron, Gradient Descent, Backpropagation, Empirical Risk Minimization, regularization, autoencoders.

Unit-III Deep Neural Networks: Difficulty of training deep neural networks, Greedy layerwise training. **Better Training of Neural Networks:** Newer optimization methods for neural networks : Adagrad, adadelta, rmsprop, adam, NAG.

Unit-IV Recurrent Neural Networks: Back propagation through time, Long Short Term Memory, Gated Recurrent Units, Bidirectional LSTMs, Bidirectional RNNs

Unit-V Convolutional Neural Networks: LeNet, AlexNet. **Generative models:** Restrictive Boltzmann Machines (RBMs),

Textbooks

1. Deep Learning, Ian Goodfellow and Yoshua Bengio and Aaron Courville, MIT Press, 2016. Available online at <https://www.deeplearningbook.org/>

References:

1. Neural Networks: A Systematic Introduction, Raúl Rojas, 1996
2. Pattern Recognition and Machine Learning, Christopher Bishop, 2007



SRI VASAVI ENGINEERING COLLEGE (Autonomous)

PEDATADEPALLI, TADEPALLIGUDEM-534 101

Department of Computer Science & Technology

Date: 20.04.2019

Annexure-VI

COURSE STRUCTURE OF FIRST YEAR B.TECH (CST)

(For 2019 - 2020 Admitted Batch)

I SEMESTER

S.No	Course Code		Course Name	L	T	P	C
1	V18ENT01		English – I	2	-	-	MNC
2	V18MAT01	BSC	Engineering Mathematics – I	3	1	-	4
3	V18PHT02	BSC	Semiconductor Physics And Opto-Electronic Devices	3	1	-	4
4	V18EET01	ESC	Basic Electrical and Electronics Engineering	3	1	-	4
5	V18CHT02		Environmental Studies	3	-	-	MNC
6	V18ENL01		English Communication Skills Lab – I	-	-	2	MNC
7	V18MEL01	ESC	Engineering & IT Workshop	-	-	3	1.5
8	V18EEL01	ESC	Basic Electrical and Electronics Engineering Lab	-	-	3	1.5
9	V18PHL02	BSC	Semiconductor Physics And Opto-Electronic Devices Lab	-	-	3	1.5
Total				14	3	11	16.5

Total Contact Hours: 28

II SEMESTER

S. No	Course Code		Course Name	L	T	P	C
1	V18ENT02	HSS	English – II	2	-	-	2
2	V18MAT02	BSC	Engineering Mathematics – II	3	1	-	4
3	V18CHT01	BSC	Engineering Chemistry	3	1	-	4
4	V18CST01	ESC	Programming in 'C' for problem Solving	3	-	-	3
5	V18MET01	ESC	Engineering Graphics	1	-	3	2.5
6	V18ENL02	HSS	English Communication Skills Lab – II	-	-	2	1
7	V18CSL01	ESC	Programming Lab in 'C' for problem Solving	-	-	3	1.5
8	V18CHL01	BSC	Engineering Chemistry Lab	-	-	3	1.5
Total				12	2	11	19.5

Total Contact Hours: 25