SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE
(An Autonomous Institution)
(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi, ISO 9001:2000 Certified Institution &
Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry - 605 107

Department of Computer Science

Minutes of Board of Studies Meeting

The first Board of Studies meeting of Department of Computer Science was held on 27.08.2020 at 01:00 P.M in the Department of Computer Science, Sri Manakula Vinayagar Engineering College with the Head of the Department in the Chair.

The following members were present for the BoS meeting

Sl.No	Name of the Member with Designation and official Address	Responsibility in the BoS	Signature
1	Mr. M. SHANMUGAM,M.Sc.,M.Phil.,M.E.,SET, (Ph.D) Assoc. Prof. and Head, Department of Computer Science, SMVEC	Chairman	
External Members			
2	Dr. R. RAMKUMAR MCA, M.Phil, Ph.D Associate Prof and Head, Department of Computer Applications, Nandha Arts & Science College, Perundurai Road, Erode. Email:ramkumar2006@gmail.com Mobile: 9600966086	University Nominee	
3	Dr. V. J. CHAKRAVARTHY, MCA, M.Phil, Ph.D, Professor, PG Department of Computer Science, The New College (Autonomous), Chennai. Email:chakkuckm1808@gmail.com Mobile: 9884161687	Subject Expert	
4	Dr. S. MANJU PRIYA, M.Sc.,M.Phil.,Ph.D., SET, Professor, Department of Computer Science, Karpaga Academy of Higher Education, Coimbatore. Email:smanjupr@gmail.com Mobile: 9600553725	Subject Expert	
5	YOGA SUBHAKARA BABU PYDIKONDALA, B.Tech., Systems Engineer, TCS, Chennai. Email:subhakarababu@gmail.com Mobile: 9514771255	Industry Expert	
Internal Members			
6	Dr. R. RAJU, Professor and Head, Department of IT, Sri Manakula Vinayagar Engineering College, Email:hodit@smvec.ac.in Mobile: 8973005555	Internal member	
7	Mr. M. GANESAN, Associate Professor, Dept. of CSE, Sri ManakulaVinayagar Engineering College E-mail:ganesan@smvec.ac.in Mobile:9486341535	Internal member	
Co-opted Members			
8	Mrs.P. Rajeswari, M.A., B.Ed., M.Phil., Associate Professor, Department of English, SMVEC	Co-opted Member	
9	Mr. M. EGALITE FRANCIS, M.Sc., M.Phil., Asst. Prof., Department of Mathematics, SMVEC	Co-opted Member	

Agenda of the Meeting

1.1) To discuss about the curriculum Structure of B.Sc. Computer Science.

1.2) To discuss and approve the B.Sc. Degree Regulations 2020 (R-2020), Curriculum and Syllabi of I and II semesters for the B.Sc. – Computer Science and the students admitted in the Academic Year 2020-21. (First Year).

1.3) To discuss about the uniqueness of the Curriculum (R-2020).

1.4) To discuss and approve Evaluation Systems.

1.5) To discuss about the Innovative Teaching / Practices Methodology adopted to handle the emerging / Advanced Technological concept courses.

1.6) Any other item with the permission of chair.

Minutes of the Meeting

Dr. V.S.K. Venkatachalapathy, Director cum Principal, opened the meeting by welcoming and introducing the external members, to the internal and co-opted members and thanked them for accepting to become the members of the Board of Studies and the meeting thereafter deliberated on agenda items that had been approved by the Chairman.

Item:1 The Vision and Mission statements have been approved by the BoS members.

Item:2 Curriculum Structure was discussed and recommended to the Academic Council.

    a) Discussed about Regulations 2020 (R2020) and they have recommended to Academic Council.

    b) In curriculum, the experts have given the following suggestions.

        In Semester II, "C++ and DataStructures" subject can be separated into two subjects as "Programming in C++" and "DataStructures" and alter the other subjects accordingly without affecting credit points.

    c) BoS members have appreciated the overall curriculum structure which includes both the fundamental concepts as well as the advanced concepts and the "Research Methodology" paper as Skill Enhancement course in Semester VI.

    d) Experts have given some suggestions in the syllabus of Sem I and II.

Item:3

    i) Fundamentals of Computing can be included at Unit I in Programming in C subject.

    ii) Number system concept can be included in "Digital Logic and Computer Organization" subject.

    iii) Recommended to Exclude "Sorting and Searching Techniques" from Programming in C Lab.

    iv) "Study about ICs" and "Johnson and Ring counters" can be included in "Digital Lab".

    v) In Semester II, "Basic Operating System concepts" can be included in Unit I of "Operating System" subject.

Item:4 The uniqueness of the curriculum was discussed and accepted by BoS Members.

**Item:5** Evaluation system was discussed and accepted by BoS experts.

Item:6 Discussed about Innovative Teaching / Practices Methodology adopted to handle the emerging / advanced technologies and experts have appreciated it.

Item:7 Panel of Examiners was discussed and recommended to the Academic Council.

Item:8 Discussed about the Job Opportunities and Higher Studies opportunities of B. Sc. Computer Science.

The meeting was concluded at 3:00 PM with vote of thanks by Mr. M. Shanmugam, Head of the Department, Department of Computer Science.
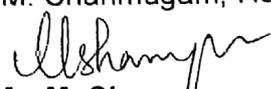
Mr. M. Shanmugam,
Chairman-BoS(CS)

Director cum Principal

Department of Computer Science   First BoS Meeting

SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE
Madagadipet, Puducherry– 605107

DEPARTMENT OF COMPUTER SCIENCE
BACHELOR OF SCIENCE (B.Sc.)

CURRICULUM AND SYLLABUS

(For students admitted from academic year 2020-2021 onwards)

SEMESTER – I											
Part No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory											
I	A20TAT101	Language - I	MIL	3	-	-	3	25	75	100
II	A20GET101	English – I	ENG	3	-	-	3	25	75	100
III	A20CPT101	Problem Solving using C	DSC	4	1	-	4	25	75	100
III	A20CPT102	Digital Logic and Computer Organization	DSC	4	1	-	4	25	75	100
III	A20MAT121	Computational Mathematics	IDC	3	1	-	4	25	75	100
IV	A20AET101	*Environmental Studies	AECC	2	-	-	2	100	-	100
Practical											
III	A20CPP101	Programming in C Lab	DSC	-	-	4	2	50	50	100
III	A20CPP102	Digital Lab	DSC	-	-	4	2	50	50	100
IV	A20CPT1EE	*Quantitative Aptitude and Logical Reasoning – I (EEC-1)	EEC	-	-	4	2	100	-	100
I Semester Total Credits/Marks							**26**	425	475	**900**

SEMESTER – II											
Part No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory											
I	A20TAT202	Language-II	MIL	3	-	-	3	25	75	100
II	A20GET202	English-II	ENG	3	-	-	3	25	75	100
III	A20CPT203	Programming in C++	DSC	4	1	-	4	25	75	100
III	A20CPT204	Data Structures	DSC	4	1	-	4	25	75	100
III	A20MAT222	Discrete Mathematics	IDC	3	1	-	4	25	75	100
IV	A20AET202	*Value Education	AECC	2	-	-	2	100	-	100
Practical											
III	A20CPP203	Programming in C++ Lab	DSC	-	-	4	2	50	50	100
III	A20CPP204	Data Structures Lab	DSC	-	-	4	2	50	50	100
IV	A20CPP2EE	*Communication Skill (EEC-2)	EEC	-	-	4	2	100	-	100
IV	A20CPP2EA	*Yoga / NSS	EA	-	-	2	1	50	-	50
II Semester Total Credits/Marks							**27**	475	475	**950**

SEMESTER – III

Part No.	Course Code	Course Title	Category	L	T	P	Credits	CAM	ESM	Total
				Periods				**Max. Marks**		
Theory										
III	A20CPT305	Python Programming	DSC	4	1	-	4	25	75	100
III	A20CPT306	Software Engineering	DSC	4	-	-	3	25	75	100
III	A20CPT307	Microprocessors and Assembly Language Programming	DSC	4	1	-	4	25	75	100
III	A20MAT323	Numerical Methods	IDC	3	1	-	4	25	75	100
III	A20CPT3NE	Wireless Technology	GE	3	-	-	3	25	75	100
Practical										
III	A20CPP305	Python Programming LAB	DSC	-	-	4	2	50	50	100
III	A20CPP306	Microprocessors LAB	DSC	-	-	4	2	50	50	100
IV	A20CPP3SE	*MS-Excel (SEC-I)	SEC	-	-	2	2	100	-	100
IV	A20CPP3EE	* Data Science (EEC-3)	EEC	-	-	4	2	100	-	50
III Semester Total Credits/Marks							**26**	425	475	**850**

SEMESTER – IV

Part No.	Course Code	Course Title	Category	L	T	P	Credits	CAM	ESM	Total
				Periods				**Max. Marks**		
Theory										
III	A20CPT408	Operating Systems	DSC	3	1	-	4	25	75	100
III	A20CPT409	Database Management Systems	DSC	3	1	-	4	25	75	100
III	A20CPT410	Object Oriented Systems Design	DSC	4	-	-	3	25	75	100
III	A20CPT411	Computer Graphics and Multimedia	DSC	4	-	-	3	25	75	100
III	A20CPT4NE	Social Media Management	GE	3	-	-	3	25	75	100
Practical										
III	A20CPP407	Operating Systems Lab	DSC	-	-	4	2	50	50	100
III	A20CPP408	DBMS Lab	DSC	-	-	4	2	50	50	100
IV	A20CPP4SE	* Android App Development (SEC-II)	SEC	-	-	2	2	100	-	100
IV	A20CPP4EE	* Internet of Things(EEC-4)	EEC	-	-	4	2	100	-	100
IV Semester Total Credits/Marks							**25**	425	475	**900**

Part No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	**T**	**P**		**CAM**	**ESM**	**Total**
SEMESTER – V

SEMESTER – V

Part No.	Course Code	Course Title	Category	L	T	P	Credits	CAM	ESM	Total
Theory										
III	A20CPT512	Java Programming	DSC	4	1	-	4	25	75	100
III	A20CPT513	Computer Networks	DSC	4	1	-	4	25	75	100
III	A20CPT514	Artificial Intelligence	DSC	3	1	-	4	25	75	100
III	A20CPE50_	Discipline Elective-I	DSE	3	-	-	3	25	75	100
Practical										
III	A20CPP509	Java and Network Programming Lab	DSC	-	-	4	2	50	50	100
III	A20CPP510	Mini Project (C# / JAVA)	DSC	-	-	4	2	50	50	100
IV	A20CPP5SE	* In-Plant training / Internship (SEC-III)	SEC	-	-	2	2	100	-	100
IV	A20CPP5EE	* Blockchain Technology (EEC-5)	EEC	-	-	4	2	100	-	100
	**V Semester Total Credits/Marks**	**23**	400	400	**800**

SEMESTER – VI

Part No.	Course Code	Course Title	Category	L	T	P	Credits	CAM	ESM	Total
Theory										
III	A20CPT615	Web Technology	DSC	3	1	-	4	25	75	100
III	A20CPT616	Programming with PHP	DSC	3	-	-	3	25	75	100
III	A20CPT617	Cloud Computing	DSC	3	-	-	3	25	75	100
III	A20CPE60_	Discipline Elective-II	DSE	3	-	-	3	25	75	100
Practical										
III	A20CPR611	Project Work& Viva-voce	DSC	-	-	10	5	40	60	100
IV	A20CPP6SE	Research Methodology(SEC-IV)	SEC	-	-	2	2	100	-	100
	**VI Semester Total Credits/Marks**	**20**	240	360	**600**

SEMESTER WISE CREDIT DISTRIBUTION

Semester	I	II	III	IV	V	VI	Total
Credits	**26**	**27**	**26**	**25**	**23**	**20**	**147**

Abbreviation for short code:

L- Number of lecture hours per week

T - Number of tutorial hours per week

P - Number of practical hours per week

DSC-Domain Specific Core

DSCP- Domain Specific Core Practical

EEC- Employability Enhancement Course

IDC- Interdisciplinary Core

DSE -Domain specific Elective

GE – Generic / Open Elective

CAM – Continuous Assessment Marks

ESM– End Semester Marks

EA- Extra Curricular Activities

*Internal Evaluation Only

CREDIT DISTRIBUTION

Sem	MIL	Eng	DSC	DSE	IDC	GE / OE	SEC	AEC	EEC	EA	Total
I	3	3	12	-	4	-	-	2	2	-	26
II	3	3	12	-	4	-	-	2	2	1	27
III	-	-	15	-	4	3	2	-	2	-	26
IV	-	-	18	-	-	3	2	-	2	-	25
V	-	-	16	3	-	-	2	-	2	-	23
VI	-	-	15	3	-	-	2	-	-	-	20
Total	6	6	88	6	12	6	8	4	10	1	147

Total credits for Part I & II (Language and English) : 12 Credits

LANGUAGE AND ENGLISH										
S. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
1.	A20TAT101	Language - I	MIL	3		-	3	25	75	100
2.	A20GET101	English – I	ENG	3		-	3	25	75	100
3.	A20TAT202	Language-II	MIL	3	-	-	3	25	75	100
4.	A20GET202	English-II	ENG	3	-	-	3	25	75	100

Part-III: DISCIPLINE SPECIFIC CORE – Theory -   63 Credits

CORE PAPERS										
S. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM		Total
1.	A20CPT101	Problem Solving using C	DSC	4	1	-	4	25	75	100
2.	A20CPT102	Digital Logic and Computer Organization	DSC	4	1	-	4	25	75	100
3.	A20CPT203	Programming in C++	DSC	4	1	-	4	25	75	100
4.	A20CPT204	Data Structures	DSC	4	1	-	4	25	75	100
5.	A20CPT305	Python Programming	DSC	4	1	-	4	25	75	100
6.	A20CPT306	Software Engineering	DSC	4	-	-	3	25	75	100
7.	A20CPT307	Microprocessors and Assembly Language Programming	DSC	4	1	-	4	25	75	100
8.	A20CPT408	Operating Systems	DSC	3	1	-	4	25	75	100
9.	A20CPT409	Database Management Systems	DSC	3	1	-	4	25	75	100
10.	A20CPT410	Object Oriented Systems Design	DSC	4	-	-	3	25	75	100
11.	A20CPT411	Computer Graphics and Multimedia	DSC	4	-	-	3	25	75	100
12.	A20CPT512	Java Programming	DSC	4	1	-	4	25	75	100
13.	A20CPT513	Computer Networks	DSC	4	1	-	4	25	75	100
14.	A20CPT514	Artificial Intelligence	DSC	3	1	-	4	25	75	100

15.	A20CPT615	Web Technology	DSC	3	1	-	4	25	75	100
16.	A20CPT616	Programming with PHP	DSC	3	-	-	3	25	75	100
17.	A20CPT617	Cloud Computing	DSC	3	-	-	3	25	75	100

Part-III : DISCIPLINE SPECIFIC CORE – Practical's/Projects - 25 Credits

DISCIPLINE SPECIFIC CORE – Practical's/Projects										
S. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM		Total
1	A20CPP101	Programming in C Lab	DSC	-	-	4	2	50	50	100
2	A20CPP102	Digital Lab	DSC	-	-	4	2	50	50	100
3	A20CPP203	Programming in C++ Lab	DSC	-	-	4	2	50	50	100
4	A20CPP204	Data Structures Lab	DSC	-	-	4	2	50	50	100
5	A20CPP305	Python Programming Lab	DSC	-	-	4	2	50	50	100
6	A20CPP306	Microprocessors Lab	DSC	-	-	4	2	50	50	100
7	A20CPP407	Operating System Lab	DSC	-	-	4	2	50	50	100
8	A20CPP408	DBMS Lab	DSC	-	-	4	2	50	50	100
9	A20CPP509	Java and Network Programming Lab	DSC	-	-	4	2	50	50	100
10	A20CPP510	Mini Project (C# / JAVA)	DSC	-	-	4	2	50	50	100
11	A20CPR611	Project Work& Viva-voce	DSC	-	-	10	5	40	60	100

Part-III: DISCIPLINE SPECIFIC ELECTIVES – 06 Credits

DISCIPLINE SPECIFIC ELECTIVES										
S. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Stream-1 (Software Management)										
1	A20CPE501	Object Oriented Analysis and Design	DSE	3	-	-	3	25	75	100
2	A20CPE502	Software Project Management	DSE	3	-	-	3	25	75	100
3	A20CPE503	Software Quality Assurance	DSE	3	-	-	3	25	75	100
4	A20CPE504	Software Testing and Tools	DSE	3	-	-	3	25	75	100
5	A20CPE505	IT Assessment and Risk Analysis	DSE	3	-	-	3	25	75	100
Stream-2 (Information Security)										
1	A20CPE601	Information Security	DSE	3	-	-	3	25	75	100
2	A20CPE602	Network Security	DSE	3	-	-	3	25	75	100
3	A20CPE603	Ethical Hacking	DSE	3	-	-	3	25	75	100
4	A20CPE604	Cyber Security	DSE	3	-	-	3	25	75	100
5	A20CPE605	Intrusion Detection System and Prevention	DSE	3	-	-	3	25	75	100

Part-III: Inter-Disciplinary Courses – 12 Credits

S. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
1	A20MAT121	Computational Mathematics	IDC	3	1	-	4	25	75	100
2	A20MAT222	Discrete Mathematics	IDC	3	1	-	4	25	75	100
3	A20MAT323	Numerical Methods	IDC	3	1	-	4	25	75	100

Part-IV:OPEN ELECTIVES / GENERAL ELECTIVES - 06 Credits

S. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
1	A20CPT3NE	Wireless Technology	GE	3	-	-	3	25	75	100
2	A20CPT4NE	Social Media Management	GE	3	-	-	3	25	75	100

Part-IV: SKILL ENHANCEMENT COURSES - 08 Credits

S. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
1	A20CPP3SE	MS-Excel (SEC-I)	SEC	-	-	2	2	100	-	100
2	A20CPP4SE	Android App Development (SEC-II)	SEC	-	-	2	2	100	-	100
3	A20CPP5SE	In-Plant training / Internship (SEC-III)	SEC	-	-	2	2	100	-	100
4	A20CPP6SE	Research Methodology(SEC-IV)	SEC	-	-	2	2	100	-	100

Part-IV: EMPLOYMENT ENHANCEMENT COURSES / EXTRA-CURRICULAR ACTIVITIES - 12 Credits

S. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
1	A20CPT1EE	Quantitative Aptitude and Logical Reasoning – I (EEC-1)	EEC	-	-	4	2	100	-	100
2	A20CPP2EE	Communication Skill (EEC-2)	EEC	-	-	4	2	100	-	100
3	A20CPP3EE	Data Science (EEC-3)	EEC	-	-	4	2	100	-	50
4	A20CPP4EE	Internet of Things(EEC-4)	EEC	-	-	4	2	100	-	100
5	A20CPP5EE	Blockchain Technology(EEC-5)	EEC	-	-	4	2	100	-	100
6	A20CPP2EA	Yoga / NSS	EA	-	-	2	1	50	-	50
7	A20AET101	Environmental Studies	AECC	2	-	-	2	100	-	100
8	A20AET202	Value Education	AECC	2	-	-	2	100	-	100

Head of the Department   **Director cum Principal**

	L	T	P	C	Hrs
A20CPT101 **Problem Solving using C**	4	1	-	4	45

Course Objectives
- To understand the Fundamentals of Computers and introduction to C language.
- To study the basic terminologies of C language and arrays
- To understand the Functions, Structures and Unions.
- To understand the concepts of Pointers.
- To study about File Management Operations in C.

Course Outcomes
After completion of the course, the students will be able to
CO1 - Develop simple applications in C using basic constructs.
CO2 - Incorporating the use of sequential, selection and repetition control structures into a program.
CO3 - Develop simple programs using functions, structures and unions.
CO4 - Design and develop programs using Pointers.
CO5- Understand the File management Operations and Pre-processor Directives.

UNIT I INTRODUCTION TO C   (9 Hrs)

Fundamentals of Computer: Computer Definition – Block Diagram of Computer – Types of Computer – Characteristics of Computer – Applications of Computer.

C programming: Overview of C – Constants – Compiling a C Program - Variables and Data Types - Technical Difference between Keywords and Identifiers - Types of C Qualifiers and format specifies - Operators and Expressions - Operators Precedence - Type conversion - Input-Output Statements.

UNIT II DECISION MAKING   (9 Hrs)
Decision making and branching- Relational operators – Logical operators- if – if else-if else if –nested if.Switch-case.

UNIT III LOOPING ANDARRAYS   (9 Hrs)

Looping: while - do while – for – break – continue - nested loop.Arrays: One Dimensional Arrays-Two-Dimensional Arrays-Multi-Dimensional Array-Dynamic arrays-Character Arrays and String-Sorting - Searching.

UNIT IV FUNCTIONS, POINTERS   (9 Hrs)

Functions: Introduction - Definition – Declaration – Categories of Functions - Nesting of Functions, Recursive functions - Passing Arrays to Functions - Strings – String library function. Pointers: Introduction - Declaring Pointer Variables - Initialization of Pointer Variables - Accessing the address of a variable - Accessing a variable thorough Pointer - Chain of Pointers - Pointer Expressions - Pointers and arrays – Pointers and functions – Call by Reference - Pointers and character strings - Array of Pointers - Pointers and Structures.

UNIT V STRUCTURES AND UNIONS, FILE MANAGEMENT   (9 Hrs)

User defined data types: Introduction – Structure: definition - declaration - Arrays of Structures – Nestedstructures – Passing structures to functions — Union - Enumeration and Typedef. Introduction to FileHandling in C, Input and Output operations on a file – Error Handling - Random access to files – commandline arguments.Introduction to pre-processor – Macro substitution directives – File inclusion directives –conditional compilation directives – Miscellaneous directives.

Text Books
1. Balagurusamy. E, "Programming in ANSI C", Tata McGraw Hill, 8th Edition, 2019.
2. Byron S Gottfried and Jitendar Kumar Chhabra, "Programming with C", Tata McGraw Hill Publishing Company, Fourth Edition, New Delhi, 2015.
3. Herbert Schildt," C: The Complete Reference", McGraw Hill, Fourth Edition, 2014.
4. YashwantKanetkar, "Let us C", BPB Publications, 16th Edition, 2017.
5. Archana Kumar, "Computer Basics with Office Automation", Dreamtech Press – Wiley Publisher, 2019.
6. ReemaThareja, "Fundamentals of Computing & C Programming" Oxford University Press, 2012.

Reference Books
1. Ashok N Kamthane, "Computer Programming", Pearson education, Second Impression, 2012.
2. VikasVerma, "A Workbook on C ", Cengage Learning, Second Edition, 2012.
3. Dr. P. Rizwan Ahmed, "Office Automation", Margham Publications, 2016.
4. P.Visu, R.Srinivasan and S.Koteeswaran, "Fundamentals of Computing and Programming", Fourth Edition, Sri Krishna Publications, 2012.
5. PradipDev, ManasGhoush, "Programming in C", Second Edition, Oxford University Press, 2011.
6. Stephen G.Kochan, "Programming in C", Third Edition, Pearson Education India, 2005.
7. Kernighan,B.W and Ritchie,D.M, "The C Programming language", 2nd Edition, Pearson Education, 2006.

Web Resources

1. https://www.programiz.com/c-programming
2. https://www.geeksforgeeks.org/c-language-set-1-introduction/
3. https://www.tutorialspoint.com/cprogramming
4. https://www.assignment2do.wordpress.com/.../solution-programming-in-ansi-c
5. https://nptel.ac.in/courses/106/104/106104128/
6. https://www.coursera.org/courses?query=c%20programming
7. https://www.udemy.com/course/c-programming-for-beginners-/

	DIGITAL LOGIC AND COMPUTER ORGANIZATION	L	T	P	C	Hrs
A20CPT102		4	1	-	4	45

Course Objectives

- To understand modern and digital computers.
- To learn the different types of data representation.
- To study about the different registers.
- To gain knowledge microprocessor and its architecture.
- To understand classification of computers.

Course Outcomes

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

CO1 – Analyze the working of logic circuits and its components.

CO2 - Categorize the different data representation and error detection.

CO3–Summarize the different the bus and circuits.

CO4–Understand the different memory organization of the computer.

CO5 - Summarize the different classification of computers and pipeline process.

UNIT-I   INTRODUCTION TO COMPUTERS   (9 Hrs)

Number Systems: Types of Number Systems – Type Conversions: Dec to Bin, Dec to Oct, Dec to Hex, Bin to Dec, Oct to Dec, Hex to Dec, Bin to Oct, Bin to Hex, Oct to Bin, Hex to Bin,

Analog, Digital, Hybrid and Modern Digital Computers. Digital Logic circuits and Components: Logic gates, Boolean algebra, K- maps, Half Adder, Full Adder, Coder, Decoder, Multiplexer, Demultiplexer, Flip-flop, Counters, Registers, Basic design of ALU.

UNIT-II   DATA REPRESENTATION   (9 Hrs)

Data types, Complements, Fixed Point Representation, Floating Point Representation, Error Detection codes.

UNIT III   REGISTER TRANSFER AND MICROPERATIONS   (9 Hrs)

Register Transfer language, Bus and memory Transfer, Binary Adder, Binary Subtracter, Binary Adder – Subtracter, Binary Increment, Binary Decrement, Arithmetic Circuit, Addition and Subtraction Algorithms.

UNIT IV   MEMORY AND PROCESSOR ORGANIZATION   (9 Hrs)

Memory Hierarchy, Main Memory (RAM & ROM) Associative memory, cache memory, Auxiliary memory, General Register Organization, Stack Organization, Addressing modes, Instruction Formats.RISC and CISC.

UNIT V   CLASSIFICATIONS OF COMPUTERS   (9 Hrs)

Introduction to Classification of Computers and Concepts of Pipeline :Flynn's Classification, Parallel Architecture Classification, Pipelining of processes

Text Books

1. Computer System Architecture – M. Mano, Pearson Ed.
2. Morris Mono M. "Digital Logic and Computer Design",PHI Latest Pub. Ed.
3. Digital circuits and Logic Design - M.Mano, Pearson Ed.
4. Digital Logic – T.C. Bartee ,Mcgraw Hill
5. William Stalling, "Computer Organization & Architecture", Pearson education Asia.

Reference Books

1. Albert Paul Malvino, Donald P Leach, Digital principles and applications TMH, 1996.
2. Hayes J. P., "Computer Architecture &Organisation", McGraw Hill,
3. Hamacher, "Computer Organisation",
4. Computer Organization and System Software, EXCEL BOOKS.
5. Computer Organization & Architecture (TMH WBUT Series), Ghosh & Pal, TMH.

Web Resources

1. www.geeksforgeeks.org › computer-organization-and-architecture
2. www.javatpoint.com › computer-organization-and-architecture-tutorial
3. www.geeksforgeeks.org › digital-electronics-logic-design-tutorials

	L	T	P	C	Hrs
A20MAT121   **COMPUTATIONAL MATHEMATICS** | | 4 | 1 | - | 4 | 45 |

Course objectives:

- To develop the use of matrix algebra techniques for practical applications..
- To introduce effective mathematical tools for the solutions of differential equations that model physical processes
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage.
- To learn the different concepts of topics in Probability.
- To learn the different concepts of topics in statistics.

COURSE OUTCOMES

On successful completion of the module students will be able to:

CO1- Acquire the knowledge about matrices and able to compute Eigen values and Eigen
CO2- Analyze and solve Differential Equations
CO3 - Understand the use of Integrals and able to apply it.
CO4 - Understand the use probability.
CO5 - Understand the use Statistics.

UNIT I – MATRICES

Rank of a Matrix- Consistency of system of equations. Eigen values and Eigen vectors of a real matrix - Characteristic equation -Properties of Eigen values and Eigenvectors. Cayley-Hamilton Theorem - Diagonalization of matrices- Reduction of a quadratic form to canonical form by orthogonal transformation - Nature of quadratic forms.

UNIT II – DIFFERENTIAL EQUATIONS

Linear differential equations of higher order - with constant coefficients, the operator D, Euler's linear equation of higher order with variable coefficients, simultaneous linear differential equations, solution by variation of parameters method

UNIT III – INTEGRALS AND APPLICATIONS

Double integrals and Triple Integrals. Applications: Areas by double integration and volumes by triple integration.

UNIT IV – PROBABILITY

Discrete Random variable: Introduction Random variables and their event spaces The probability Mass function. Distribution functions Special discrete distributions: The Bernoulli PMF. Bernoulli Poisson, continuous random variable normal distribution.

UNIT V-STATISTICS

Measures of central tendency Arithmetic mean, Median, Mode, Geometric mean, Harmonic mean. Skewness and Kurtosis - Simple correlation Karl Pearson s coefficient. of correlation Rank correlation Regression lines of regression properties of regression coefficient.

Text Books:

1. M.K. Venkataraman, Engineering Mathematics (First Year), Second Edition, The National Publishing Company, Madras, 2001.
2. M.K. Venkataraman, Engineering Mathematics (Third Year-Part A), The National Publishing Company, Madras, 2001.
3. T. Veerarajan, —Probability, statistics and Random Processes,‖ Tata Mc.Graw-Hill   Publishing Company Ltd.,3rd Edition, 2008.

Reference Book:

1. N.P. Bali and Manish Goyal, A Text Book of Engineering Mathematics, Lakshmi Publications, New Delhi, 2007.
2. Grewal B.S., Higher Engineering Mathematics, Khanna Publishers, New Delhi, 41st Edition, 2011.
3. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008
4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
5. Erwin Kreyszig Advanced Engineering Mathematics, John Wiley & Sons, New Delhi.

Web References:
1. https://www.youtube.com/watch?v=xyAuNHPsq-g
2. https://link.springer.com/chapter/10.1007/978-1-4757-2024-2_1
3. https://ncert.nic.in/ncerts/l/lemh203.pdf
4. https://users.math.msu.edu/users/gnagy/teaching/ode.pdf
5. https://www.stat.pitt.edu/stoffer/tsa4/intro_prob.pdf
6. https://www.math.arizona.edu/~jwatkins/statbook.pdf
7. http://www.utstat.toronto.edu/mikevans/jeffrosenthal/book.pdf
8. https://homepage.divms.uiowa.edu/~rdecook/stat2020/notes/ch3_pt1.pdf

	L	**T**	**P**	**C**	**Hrs**

A20AET101   **Environmental Studies**

	L	**T**	**P**	**C**	**Hrs**
	2	-	-	2	10

Course objectives:
- To gain knowledge on the importance of natural resources and energy
- To understand the structure and function of an ecosystem.
- To understand the causes of types of pollution and disaster management.
- To observe and discover the surrounding environment through field work.

COURSE OUTCOMES

On successful completion of the module students will be able to:

CO1- gain knowledge on the importance of natural resources and energy
CO2- understand the structure and function of an ecosystem.
CO3 - understand the causes of types of pollution and disaster management.
CO4 - observe and discover the surrounding environment through field work.
CO5 - observe human pollution environment.

UNIT- I INTRODUCTION TO NATURAL RESOURCES/ENERGY
Natural Resources – Definition – Scope and Importance – Need for Public Awareness – Renewable and Non-renewable Resources: Natural resources and associated problems. Forest resources and over-exploitation – Water resources and over-utilization – Mineralresource extraction and its effects - Food resources - food problems and Modern agriculture - Energy resources and its future.

UNIT – II ECOSYSTEMS
Concept of an ecosystem-structure and function of an ecosystem-producers, consumers and decomposers- ecological succession- food chains(any 2 Examples)- food webs(any 2 Examples)- ecological pyramids.

UNIT –III ENVIRONMENTAL POLLUTION /DISASTER MANAGEMENT
Definition-causes, effects and control measures of : Air, Water and Soil pollution- e-waste management-Disaster management: Natural and man made- food/earthquake/cyclone, tsunami and landslides.

UNIT – IV SOCIAL ISSUES AND THE ENVIRONMENT
Sustainable development- Climate change: global warming, acid rain, ozone layer depletion and nuclear radiation- Environment Protection Act (any 2) air, water, wildlife and forest.

UNIT –V HUMAN POPULATION AND THE ENVIRONMENT
Population growth, variation among nations - Population explosion—Family Welfare Programme - Environment and human health - Human rights - Value education - HIV/AIDS - Women and Child Welfare - Role of Information Technology in environment and human health.

FIELD WORK
Students will visit any one of the following place of interest and submit a written report by the end of the semester:
1. Visit to a hospital/industry/canteen for solid waste management
2. Visit to a chemical industry to study about the practices followed there for waste disposal
3. Visit to Vandalur zoo for study of animal conservation/plants- flora and fauna
4. Study of simple ecosystems-lake/hill slopes
5. Naming the trees in the campus at SRM
6. Study of common plants, insects, birds in the neighbourhood
7. Study of common diseases and their prevention
8. Optional: Street plays and rally for awareness of obesity/diabetes/ vitamin D deficiency/health issues/ waste management/ solid waste management/ no plastics/ energy consumption/wild life protection.

E-BOOK
BharuchaErach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380013, India, Email:mapin@icenet.net (R)

REFERENCES

1. BharuchaErach, (2013), Textbook of Environmental Studies for Undergraduate Courses (Second edition). Telangana, India: Orient BlackSwan.
2. BasuMahua, Savarimuthu Xavier, (2017), SJ Fundamentals of Environmental Studies. Cambridge, United Kingdom: Cambridge University Press.
3. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
4. De A.K., Environmental Chemistry, Wiley Eastern Ltd.

		L	T	P	C
A20CPP101	**PROGRAMMING IN C LABORATORY**	0	0	4	2

Course Objectives

- To practice the fundamental programming methodologies in the C programming language.
- To apply logical skills for problem solving using control structures and arrays.
- To design, implement, test and debug programs that use different data types, variables, strings, arrays, pointers and structures.
- To design modular programming and provide recursive solution to problems.
- To understand the miscellaneous aspects of C and comprehension of file operations.

Course Outcomes

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

CO1 - Apply and practice logical formulations to solve simple problems leading to specific applications.
CO2 - Develop C programs for simple applications making use of basic constructs, arrays and strings.
CO3 - Develop C programs involving functions, recursion, pointers, and structures.
CO4 - Design applications using sequential and random access file processing
CO5 - Build solutions for online coding challenges.

List of Exercises

1. Simple programming exercises to familiarize the basic C language constructs.
2. Develop programs usingidentifiers and operators.
3. Develop programs using decision-making and looping constructs.
4. Develop programs using functions as mathematical functions.
5. Develop programs with user defined functions – includes parameter passing.
6. Develop program for one dimensional and two dimensional arrays.
7. Develop program to illustrate pointers.
8. Develop program with arrays and pointers.
9. Develop program for dynamic memory allocation.
10. Develop programs for file operations.

Reference Books

1. Zed A Shaw," Learn C the Hard Way: Practical Exercises on the Computational Subjects You Keep Avoiding (Like C)", Addison Wesley, 2016.
2. Anita Goel and Ajay Mittal, "Computer Fundamentals and programming in C",First edition,Pearson Education ,2011
3. YashwanthKanethkar, "Let us C", 13th Edition, BPB Publications, 2008.
4. Maureen Sprankle,Jim Hubbard," Problem Solving and Programming Concepts," 9th Edition,Pearson,2011

Web Resources

1. https://alison.com/course/introduction-to-c-programming
2. https://www.geeksforgeeks.org/c-programming-language/
3. http://cad-lab.github.io/cadlab_data/files/1993_prog_in_c.pdf
4. https://www.tenouk.com/clabworksheet/clabworksheet.html
5. https://fresh2refresh.com/c-programming/
6. http://www.skiet.org/downloads/cprogrammingquestion.pdf

	L	T	P	C
A20CPP102 **DIGITAL LABORATORY**	0	0	4	2

Course Objectives

- To acquire knowledge about basic logic gates.
- To develop the skills in writing assembly programs.
- To develop the skill for error corrections in the micro level.

Course Outcomes

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

CO1 – acquire knowledge about basic logic gates.

CO2 – develop the skills in writing assembly programs.

CO3 – Develop the skill for error corrections in the micro level.

LIST OF Exercises

1. Study of Integrated Circuits and their working Logics.
2. Verification of Boolean Theorems using Digital Logic Gates.
3. Design and Implementation of Combinational Circuits using Basic Gates Code Converters.
4. Design and Implementation of 4-Bit Binary Adder / Subtractor using Basic Gates and MSI Devices
5. Design and Implementation of Parity Generator / Checker using Basic Gates and MSI Devices.
6. Design and Implementation of Magnitude Comparator.
7. Design and Implementation of Application using Multiplexers/Demultiplexers.
8. Design and Implementation of Shift Registers.
9. Design and Implementation of Synchronous and Asynchronous Counters.
10. Design and Implementation of Johnson and Ring Counters.

Reference Books

1. Albert Paul Malvino, Donald P Leach, Digital principles and applications TMH, 1996.
2. Hayes J. P., "Computer Architecture &Organisation", McGraw Hill,
3. Hamacher, "Computer Organisation",
4. Computer Organization and System Software, EXCEL BOOKS.
5. Computer Organization & Architecture (TMH WBUT Series), Ghosh & Pal, TMH.

Web Resources

1. www.geeksforgeeks.org › computer-organization-and-architecture
2. www.javatpoint.com › computer-organization-and-architecture-tutorial
3. www.geeksforgeeks.org › digital-electronics-logic-design-tutorials

	L	T	P	C	Hrs
A20CPT203 **Programming in C++**	4	1	-	4	45

Course Objectives
- Define Encapsulation, Inheritance and Polymorphism.
- Solve the problem with object oriented approach.
- Analyze the problem statement and build object oriented system model.
- *Describe the characters and behavior of the objects that comprise a system.*
- Explain function overloading, operator overloading and virtual functions.

Course Outcomes
After completion of the course, the students will be able to
CO1 –To learn programming from real world examples.
CO2–To understand Object oriented approach for finding Solutions.
CO3- To create computer based solutions to various real-world problems using C++.
CO4–To learn various concepts of object oriented approach towards problem solving.
CO5–Develop the applications using object oriented programming with C++.

UNIT IINTRODUCTION TO C++ (9 Hrs)
Basic components of a C++ - Program and program structure - Compiling and Executing C++ Program - Data types - Expression and control statements Iteration statements in C++ - Introduction to Arrays - Multidimensional Arrays - Strings and String related Library Functions - Functions - Passing Data to Functions - Scope and Visibility of variables in Function.

UNIT II PRINCIPLES OF OBJECT ORIENTED PROGRAMMING (9 Hrs)
Basic Concepts of Object-Oriented Programming: Benefits of OOP – Object Oriented Languages – Applications of OOP. Classes objects - data members - member functions –Access Spcifiers- this Pointer - Friends - Friend Functions - Friend Classes - Friend Scope - Static Functions - Constructors and Destructors - Static variables and Functions in class - Operator Overloading in C++ - Overloading Unary Operators - Overloading binary operators.

UNIT III INHERITANCE (9 Hrs)
Inheritance in C++ - Types of Inheritance - Pointers - Objects and Pointers - Multiple Inheritance. Virtual Functions - Polymorphism - Abstract classes. Real time examples in OOPS.

UNIT IV FILES AND STREAMS (9 Hrs)
Exception Handling: Exception – Basics – Exception Handling Mechanism – Throwing Mechanism – Catching Mechanism – Rethrowing Exception. Standard input and output operations: C++ iostream hierarchy - Standard Input/output Stream Library - Organization Elements of the iostream Library - Programming using Streams - Basic Stream Concepts. File input and output: Reading a File - Managing I/O Streams - Opening a File – Different Methods - Checking for Failure with File Commands - Checking the I/O Status Flags - Dealing with Binary Files - Useful Functions.

UNIT V TEMPLATES AND STL (9 Hrs)
Class templates: Implementing a class template - Implementing class template member functions - Using a class template - Function templates - Implementing function templates - Using template functions - Template instantiation - Class template specialization - Template class partial specialization - Template function specialization - Template parameters - Static members and variables - Templates and friends - Templates and multiple-file projects. Standard Template library: Containers - iterators and application of container classes.

Textbooks
1. E. Balagurusamy, "Object Oriented Programming with C++", McGraw Hill, 7th Edition, 2018.
2. Herbert Schildt, "C++ - The Complete Reference", McGraw Hill Education, 4th edition,2017.

Reference Books

1. Herbert Schildt, "C++ - From the Ground Up", McGraw Hill Education, 2nd edition,2010.Thomas L. Floyd, "Electronic Devices", Nineth edition, Pearson Education, 2012.
2. Stanley B. Lippman, Stanley Lippman, Barbara Moo, "C++ Primer", Addison-Wesley Professiona, 5th edition 2012.

Web Resources

1. https://www.tutorialspoint.com/cplusplus/index.htm
2. http://www.cplusplus.com/doc/tutorial/
3. https://www.w3schools.com/cpp/
4. https://www.javatpoint.com/cpp-tutorial
5. https://www.geeksforgeeks.org/cpp-tutorial/

	L	**T**	**P**	**C**	**Hrs**
A20CPT204 **Data Structures**	4	1	-	4	45

Course Objectives
- To impart the basic concepts of data structures and its terminologies.
- To understand concepts about stack and queue operations.
- To understand basic concepts about linked list and its various operations.
- To understand concepts about Tree and its applications.
- To understand basic concepts about Sorting, Hashing and Graph.

Course Outcomes
After completion of the course, the students will be able to
CO1 - Analyze Fundamentals of data structures and complexity analysis
CO2 - Demonstrate stack, queue and its operation.
CO3 - Apply and analyze linked list operation.
CO4 - Construct the tree and its various applications.
CO5 - Summarize sorting, hashing and graph techniques.

UNIT I BASIC TERMINOLOGIES OF DATA STRUCTURES (9Hrs)
Introduction: Basic Terminologies: Elementary Data Organizations. Data Structure Operations: insertion, deletion, traversal. Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off. Array and its operations. Searching: Linear Search and Binary Search Techniques and their complexity analysis.

UNIT II STACK AND QUEUE OPERATIONS (9Hrs)
Stacks and Queues: ADT Stack and its operations, Applications of Stacks: Expression Conversion and evaluation. ADT Queue: Types of Queue: Simple Queue, Circular Queue, Priority Queue. Operations on each type of Queues.

UNIT III LINKED LIST OPERATIONS (9Hrs)
Linked Lists: Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion, Deletion in linked list; Linked representation of Stack and Queue. Doubly linked list: operations. Circular Linked Lists: operations.

UNIT IV TREES (9Hrs)
Trees: Basic Tree Terminologies, Different types of Trees: Binary Tree, Threaded Binary Tree, Binary Search Tree, Binary Tree Traversals, AVL Tree. Introduction to B-Tree and B+ Tree.

UNIT V SORTING, HASHING AND GRAPHS (9Hrs)
Sorting: Bubble Sort, Selection Sort, Insertion Sort, Heap Sort, Shell Sort and Radix Sort. Performance and Comparison among the sorting methods. Hashing: Hash Table, Hash Function and its characteristics. Graph: Basic Terminologies and Representations, Graph traversal algorithms.

Text Books
1. Ellis Horowitz, SartajSahni,"Fundamentals of Data Structures", Illustrated Edition, Computer Science Press, 2018.
2. Thomas H. Coreman, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", PHI, Third Edition, 2010.
3. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft, "Data Structures and Algorithms", 4th Edition, 2009.

Reference Books
1. Mark Allen Weiss," Algorithms, Data Structures and Problem Solving with C++", Illustrated Edition, Addison-Wesley Publishing Company, 1995.

Web Resources

1. https://www.geeksforgeeks.org/data-structures/
2. https://www.javatpoint.com/data-structure-tutorial/
3. https://www.studytonight.com/data-structures/
4. https://www.tutorialspoint.com/data_structures_algorithms/
5. https://www.w3schools.in/data-structures-tutorial/intro/
6. https://nptel.ac.in/courses/106103069/

	L	**T**	**P**	**C**	**Hrs**
A20MAT222　　　　**DISCRETE MATHEMATICS**	4	1	-	4	45

Course Objectives

- To understand the concepts of Logical operations and Prepositions.
- To familiarize the concept of set theory and their relations
- To understand the basic concepts of functions.
- To familiarize the applications of algebraic structures.
- To understand the concepts and significance of Graph theory

Course Outcomes

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

CO1 – Acquire the knowledge about the concepts needed to test the logic of a program.
CO2 – Understand to identifying the sets and relations.
CO3 – Understand to identifying the functions and algorithm.
CO4 – Apply the concept of algebraic and groups.
CO5 – Understand the basic concepts of graph theory and colorings.

UNIT I PROPOSITIONAL CALCULUS　　　　　　　　　　　　　　(9Hrs)

Propositional calculus: Propositions and compound propositions, connectives, Logical operations - Propositions and Truth tables, Tautologies and contradictions, Logical equivalence - Algebra of proposition - conditional and Bi-conditional statements – Quantifiers - Negation of quantifier statements.

UNIT II SET THEORY　　　　　　　　　　　　　　　　　　　(9Hrs)

Set Theory: Sets Basic concepts notation inclusion and equality of sets - Power set, set operations – Relations - composition of relations, Equivalence relations, partial order relation - n-ary relations.

UNIT III FUNCTIONS　　　　　　　　　　　　　　　　　　　(9Hrs)

Functions: one-to-one, onto and invertible functions - Mathematical functions, Exponential and Logarithmic functions - Recursively Defined functions - Algorithms and Functions - complexity of Algorithms.

UNIT IV ALGEBRAIC SYSTEMS　　　　　　　　　　　　　　　(9Hrs)

Algebraic systems - Examples and General properties - semi-groups and Monoids - Definitions and Examples - Groups: Definition and examples – Cosets and Lagrange's theorem -Normal subgroups - Group homomorphism.

UNIT V GRAPH THEORY　　　　　　　　　　　　　　　　　　(9Hrs)

Graph Theory: Graphs and multi-graphs sub-graph - Isomorphic and Homeomorphic Graphs - Paths connectivity - The Bridges of Knonigsberg, Traversable multigraphs Labeled and weight graphs - complete regular and Bipartite graphs - Tree graphs - planar graphs, Graph colorings, Representation of graph in Computer memory.

Text Books

1.Venkatraman M K, Sridharan N and Chandrasekaran N, Discrete Mathematics, The National Publishing Company, 2000.
2. J.P. Tremblay and R. Manohar Discrete mathematical structures with applications to Computer Science Mc.Graw Hill Book Company, New York, 1975
3. Rosen, K.H., "Discrete Mathematics and its Applications", 7th Edition, Tata McGraw Hill Pub. Co. Ltd.,NewDelhi, Special Indian Edition,2011.
4. Tremblay, J.P.and Manohar.R, "Discrete Mathematical Structures with Applications to Computer Science",TataMcGraw Hill Pub. Co. Ltd, New Delhi, 30th Reprint, 2011.
5. Kenneth H. Rosen, "Discrete Mathematics and its Applications", Fifth edition, Tata McGraw - Hill Publishing Company, Pvt. Ltd., New Delhi, 2003.

Reference Books

1. Grimaldi,R.P."Discrete and Combinatorial Mathematics: An Applied Introduction",4THEdition, Pearson Education Asia, Delhi,2007.
2. Lipschutz.S and Mark Lipson, "Discrete Mathematics", Schaum'sOutlines, Tata McGraw Hill Pub.Co. Ltd., New Delhi, 3RDEdition, 2010.
3. Koshy,T. "Discrete Mathematics with Applications "ElsevierPublications, 2006.
4. C.L. Liu, "Elements of Discrete Mathematics", 3rd Edition, Tata McGraw - Hill Education Pvt. Ltd., 2008.
5. Kenneth H. Rosen," Discrete Mathematics and Its Applications, Published September 9th 2002 by McGraw-Hill Science/Engineering/Math (first published April 1st 2000).

Web References

1.   https://nptel.ac.in/courses/111/107/111107058/
2.   https://nptel.ac.in/courses/111/104/111104026/
3.   https://nptel.ac.in/courses/106/106/106106183/
4.   http://www.math-cs.gordon.edu/courses/mat230/notes/graphs.pdf
5.   https://www.cs.utexas.edu/~isil/cs311h/lecture-graph1b-6up.pdf

UNIT – I : CONCEPT OF HUMAN VALUES, VALUE EDUCATION TOWARDS PERSONAL DEVELOPMENT

Aim of education and value education; Evolution of value oriented education; Concept of Human values; types of values; Components of value education. Personal Development : Self analysis and introspection; sensitization towards gender equality, physically challenged, intellectually challenged. Respect to - age, experience, maturity, family members, neighbours, co-workers. Character Formation Towards Positive Personality: Truthfulness, Constructivity, Sacrifice, Sincerity, Self Control, Altruism, Tolerance, Scientific Vision.

UNIT – II : VALUE EDUCATION TOWARDS NATIONAL AND GLOBAL DEVELOPMENT

National and International Values: Constitutional or national values - Democracy, socialism, secularism, equality, justice, liberty, freedom and fraternity. Social Values - Pity and probity, self control, universal brotherhood. Professional Values - Knowledge thirst, sincerity in profession, regularity, punctuality and faith. Religious Values - Tolerance, wisdom, character. Aesthetic values - Love and appreciation of literature and fine arts and respect for the same. National Integration and international understanding.

UNIT – III: IMPACT OF GLOBAL DEVELOPMENT ON ETHICS AND VALUES

Conflict of cross-cultural influences, mass media, cross-border education, materialistic values, professional challenges and compromise. Modern Challenges of Adolescent Emotions and behavior; Sex and spirituality: Comparision and competition; positive and negative thoughts. Adolescent Emotions, arrogance, anger, sexual instability, selfishness, defiance.

UNIT - IV : THERAUPATIC MEASURES
Control of the mind through
a. Simplified physical exercise
b. Meditation – Objectives, types, effect on body, mind and soul
c. Yoga – Objectives, Types, Asanas
d. Activities:
      (i) Moralisation of Desires
      (ii) Neutralisation of Anger
      (iii)Eradication of Worries
      (iv)Benefits of Blessings

UNIT - V : HUMAN RIGHTS
1. Concept of Human Rights – Indian and International Perspectives
      a. Evolution of Human Rights
      b. Definitions under Indian and International documents
2. Broad classification of Human Rights and Relevant Constitutional Provisions.
      a. Right to Life, Liberty and Dignity
      b. Right to Equality
      c. Right against Exploitation
      d. Cultural and Educational Rights
      e. Economic Rights
      f. Political Rights
      g. Social Rights

3. Human Rights of Women and Children
    a. Social Practice and Constitutional Safeguards
        (i) Female Foeticide and Infanticide
        (ii) Physical assault and harassment
        (iii) Domestic violence
        (iv) Conditions of Working Women
4. Institutions for Implementation
    a. Human Rights Commission
    b. Judiciary
5. Violations and Redressel
    a. Violation by State
    b. Violation by Individuals
    c. Nuclear Weapons and terrorism
    d. Safeguards.

	L	T	P	C
A20CPP203 **Programming In C++ Lab**	0	0	4	2

Course Objectives

- To introduce   the   concepts of Basic Object Oriented concepts and Programming Basics.
- To gain insight into the Functions and Array usages using C++.
- To understand in depth about the Classes and Objects.
- To   study   the   Operator overloading and Inheritance concepts.
- To acquaint the Files and Exception Handling concepts.

Course Outcomes

After completion of the course, the students will be able to
CO1– Understand the Object Oriented concepts.
CO2– Understand the Functions and Arrays.
CO3– Construct the Classes and Objects.
CO4– Explain the Operator overloading and Inheritance concepts.
CO5– Describe Files and Exception Handling Methods.

List of Exercises

Write C++ Programs for the followings:

1. Class Declarations, Definition, and Accessing Class Members.
2. Constructor, parameterized constructor and copy constructors.
3. Friend Function and Friend Class.
4. Function Overloading and Constructor Overloading.
5. Operator Overloading.
6. Inheritances.
7. Virtual Classes and Abstract Classes.
8. Exception Handling.
9. IOStream, IStream, Ostream classes and their usages.
10. FileStream Operations.
11. Template Based Program to Sort the Given List of Elements.

Reference Books

1. Herbert Schildt, "C++ - From the Ground Up", McGraw Hill Education, 2nd edition,2010.
2. Stanley B. Lippman, Stanley Lippman, Barbara Moo, "C++ Primer", Addison-Wesley Professional, 5th edition 2012.

Web Resources

1. https://www.tutorialspoint.com/cplusplus/index.htm
2. http://www.cplusplus.com/doc/tutorial/
3. https://www.w3schools.com/cpp/
4. https://www.javatpoint.com/cpp-tutorial
5. https://www.geeksforgeeks.org/cpp-tutorial/

	L	T	P	C

A20CPP204   **Data Structures Lab**

L	T	P	C
-	-	4	2

Course Objectives
- To learn the basic concepts of Data Structures.
- To learn about the concepts of Searching and Sorting.
- To study about the linear and non-linear Data Structures.

Course Outcomes

After completion of the course, the students will be able to
CO1 - Analyze the algorithm's / program's efficiency in terms of time and space complexity.

CO2 - Solve the given problem by identifying the appropriate Data Structure.

CO3 – Solve problems in linear and non-linear Data Structures.

List of Exercises
1. Write a C program to implement recursive and non-recursive i) Linear search ii) Binary Search.
2. Write a C program to implement i) Bubble sort ii) Selection sort iii) Insertion sort iv) Shell sort v) Heap sort.
3. Write a C program to implement the following using an array. a) Stack ADT b) Queue ADT
4. Write a C program to implement list ADT to perform following operations.
    a) Insert an element into a list.
    b) Delete an element from list
    c) Search for a key element in list
    d) count number of nodes in list.
5. Write a C program to implement the following using a singly linked list. a) Stack ADT b) Queue ADT.
6. Write a C program to implement the dequeue (double ended queue) ADT using a doubly linked list and an array.
7. Write a C program to perform the following operations:
    a) Insert an element into a binary search tree.
    b) Delete an element from a binary search tree.
    c) Search for a key element in a binary search tree.
8. Write a C program that use recursive functions to traverse the given binary tree in
    a)Preorder
    b) Inorder and
    c) Postorder.
9. Write a C program to perform the AVL tree operations.
10. Write a C program to implement Graph Traversal Techniques.

Reference Books

1. Ellis Horowitz, SartajSahni,"Fundamentals of Data Structures", Illustrated Edition, Computer Science Press, 2018.

Web Resources

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2. https://www.w3schools.in/data-structures-tutorial/intro/
3. https://nptel.ac.in/courses/106103069/
4. https://swayam.gov.in/nd1_noc20_cs70/preview
5. Data Structures Laboratory Manual, Department of Computer Science and Engineering, Sri ManakulaVinayagar Engineering College.