

E.G.S. PILLAY ENGINEERING COLLEGE

(Autonomous)

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Accredited by NAAC with 'A' Grade | Accredited by NBA
NAGAPATTINAM – 611 002



B.E. Computer Science Engineering

Second Year – Third Semester

Course Code	Course Name	L	T	P	C	Maximum Marks		
						CA	ES	Total
Theory Course								
1901MA302	Engineering Mathematics III	3	2	0	4	40	60	100
1902CS301	Data Structures	3	2	0	4	40	60	100
1902CS302	Object Oriented Programming	3	0	0	3	40	60	100
1902CS303	Computer Organization and Architecture	3	0	0	3	40	60	100
1902CS304	Digital Logic and Microprocessors	3	0	2	4	40	60	100
Laboratory Course								
1902CS351	Data Structures Lab	0	0	2	1	50	50	100
1902CS352	Object Oriented Programming Lab	0	0	2	1	50	50	100
1904GE351	Life Skills: Soft Skill	0	0	2	1	100	-	100
Audit Course								
1901MCX02	Indian Constitution	2	0	0	0	0	0	0

L – Lecture | T – Tutorial | P – Practical | CA – Continuous Assessment | ES – End Semester

1901MA302	ENGINEERING MATHEMATICS – III	L	T	P	C
	QUEUING MODEL AND NETWORK MODEL	3	2	0	4

MODULE I **12 Hours**

Dirichlet's conditions – General Fourier series – Odd and even functions – Half range sine series – Half range cosine series – Parseval's identity – Harmonic analysis.

MODULE II **12 Hours**

Statement of Fourier integral theorem – Fourier transform pair – Fourier sine and cosine transforms – Properties – Transforms of simple functions – Convolution theorem – Parseval's identity

MODULE III **12 Hours**

Characteristics of Queuing Models – Markovian Queues – $(M / M / 1) : (FIFO / \infty / \infty)$, $(M / M / 1) : (FIFO / N / \infty)$, $(M / M / C) : (FIFO / \infty / \infty)$, $(M / M / C) : (FIFO / N / \infty)$ models – Little's formulae.

MODULE IV NETWORK MODEL **12 Hours**

Network Construction – Critical Path Method – Project Evaluation and Review Technique – Resource analysis in Network Scheduling.

MODULE V TRANSPORTATION AND ASSIGNMENT MODELS **12 Hours**

Mathematical formulation of transportation problem- Methods for finding initial basic feasible solution – optimum solution - degeneracy – Mathematical formulation of assignment models – Hungarian Algorithm – Variants of the Assignment problem

TOTAL: 60 HOURS

REFERENCES:

1. Veerarajan. T., "Transforms and Partial Differential Equations", Second reprint, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2012.
2. Grewal. B.S., "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, Delhi, 2012.
3. Gross.D and Harris C.M, "Fundamentals of Queuing Theory", Wiley Student Edition, 2004.
4. Robertazzi, "Computer Networks and Systems: Queuing Theory and performance Evaluation", Springer, 3rd Edition, 2006
5. Taha H.A. "Operations Research", Pearson education, Asia, 8th Edition, 2007
6. Trivedhi K.S, "Probability and statistics with Reliability, queuing and Computer Science Applications", John Wiley and Sons, 2nd Edition, 2002
7. Kalavathy S, Operations Research, Second Edition, Vikas Publishing House, 2004.
8. nptel.ac.in/courses/111105035, www.nptelvideos.in/2012/11/Mathematics.html
9. www.learnerstv.com/Free-maths-video lectures - ltv348-page1.html

1902CS301

DATA STRUCTURES

L	T	P	C
3	2	0	4

MODULE I LINEAR DATA STRUCTURES – LIST

12 Hours

Introduction, Data structure Types - Data structure operations - Abstract Data Types (ADTs) – List ADT – array-based implementation – linked list implementation —singly linked lists- circularly linked lists- doubly linked lists – applications of lists –Polynomial Manipulation.

MODULE II LINEAR DATA STRUCTURES – STACK AND QUEUE

12 Hours

STACK: Array implementation, Linked list implementation, Applications of stack: Infix to Postfix, Evaluation of Postfix, Balancing symbols, Nested function calls, Recursion, Towers of Hanoi. QUEUE: Array implementation, Linked List implementation, Circular Queue.

MODULE III SORTING, SEARCHING AND HASH TECHNIQUES

12 Hours

Sorting algorithms: Insertion sort - Selection sort - Shell sort - Bubble sort - Quick sort - Merge sort - Radix sort – Searching: Linear search –Binary Search Hashing: Hash Functions – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing

MODULE IV NON LINEAR DATA STRUCTURES – TREES

12 Hours

General trees, Terminology, Representation of trees, Tree traversal- Binary tree, Representation, Expression tree, Binary tree traversal, Binary Search Tree: Construction, Searching, Insertion, Deletion, AVL trees: Rotation, Insertion, Deletion, B-Trees, Splay trees, Red-Black Trees.

MODULE V NON LINEAR DATA STRUCTURES – GRAPHS

12 Hours

Representation of Graphs – Breadth-first search – Depth-first search – Topological sort – Minimum Spanning Trees – Kruskal’s and Prim’s algorithm – Shortest path algorithm – Dijkstra’s algorithm – Bellman-Ford algorithm – Floyd - Warshall algorithm.

TOTAL: 60 HOURS

REFERENCES:

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education, 2011
2. Seymour Lipschutz, "Data Structures with C", McGraw Hill Education, Special Indian Edition, 2014.
3. A.V.Aho, J.E Hopcroft and J.D.Ullman, "Data structures and Algorithms", Pearson Education, First Edition Reprint 2003.
4. R.F.Gilberg, B.A.Forouzan, "Data Structures", Second Edition, Thomson India Edition, 2005.
5. ReemaThareja, "Data Structures Using C", Oxford Higher Education , First Edition, 2011.
6. <http://nptel.ac.in/courses/106102064/1>

1902CS302	OBJECT ORIENTED PROGRAMMING	L	T	P	C
		3	0	0	3

MODULE I INTRODUCTION TO C++ 09 Hours

Introduction to C++ – classes – access specifiers – function and data members – default arguments – function overloading – friend functions – const and volatile functions – static members – Objects – pointers and objects – constant objects – nested classes – local classes

MODULE II CONSTRUCTORS 09 Hours

Constructors – default constructor – Parameterized constructors – Constructor with dynamic allocation – copy constructor – destructors – operator overloading – overloading through friend functions – overloading the assignment operator – type conversion – explicit constructor

MODULE III INTRODUCTION TO JAVA 09 Hours

Overview of java-data types-variables-operators-arrays-control statements-object and classes- methods-accessspecifiers-static members-finalize methods-constructors-exception handling

MODULE IV INHERITANCE AND POLYMORPHISM 09 Hours

Inheritance-super keyword-types of inheritance – polymorphism- method overriding-method overloading- abstract class-inner class-interfaces-reflections

MODULE V STRING HANDLING 09 Hours

String methods-special string operation-string buffer-collection framework: collection interfaces and classes- utility classes: string utility-file utility-I/O utility-entity utility-array utility

TOTAL: 45 HOURS

REFERENCES:

1. B. Trivedi, “Programming with ANSI C++”, Oxford University Press, 2007
- 2.H.M.Deitel, P.J.Deitel, “Java how to program”, Fifth edition, Prentice Hall of India private limited,2003.
3. Ira Pohl, “Object-Oriented Programming Using C++”, Pearson Education Asia, 2003.
- 4.K.R.Venugopal, RajkumarBuyya, T.Ravishankar, “Mastering C++”, TMH, 2003.
- 5.Herbert Schildt, “The Java 2: Complete Reference”, Fourth edition, TMH, 2002
6. <https://nptel.ac.in/courses/106/105/106105151/>
- 7.<https://nptel.ac.in/courses/106/105/106105191/>

1902CS303	COMPUTER ORGANIZATION AND ARCHITECTURE	L	T	P	C
		3	0	0	3

MODULE I STRUCTURE OF COMPUTERS & MACHINE INSTRUCTION 9 Hours

Functional Modules - Basic operational concepts - Bus structures - Software - performance – Technology – Instruction and instruction sequencing – Addressing modes – operations and operands-Basic I/O operations. ALU design – Fixed point and floating point operations

MODULE II BASIC PROCESSING MODULE 9 Hours

Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control – Nano programming.

MODULE III PIPELINING 9 Hours

Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets –Data path and control considerations – Performance considerations – Exception handling.

MODULE IV PARALLELISM 9 Hours

Instruction-level-parallelism – Parallel processing challenges – Flynn's classification – Hardware multithreading – Multicore processors

MODULE V MEMORY AND I/O SYSTEMS 9 Hours

Memory hierarchy - Memory technologies – Cache basics – Measuring and improving cache performance - Virtual memory - Input/output system, programmed I/O, DMA and interrupts, I/O processors.

TOTAL: 45 HOURS

REFERENCES:

1. William Stallings “Computer Organization and Architecture” , Seventh Edition Reprint, Pearson Education, 2016
2. Vincent P. Heuring, Harry F. Jordan, “Computer System Architecture”, Second Edition, Pearson Education, 2005.
3. Govindarajalu, “Computer Architecture and Organization, Design Principles and Applications”, first edition, Tata McGraw Hill, New Delhi, 2012.
4. V.P. Heuring, H.F. Jordan, “Computer Systems Design and Architecture”, 2nd Edition, Pearson Education, 2012.
5. https://onlinecourses.nptel.ac.in/noc18_cs29/preview

1902CS304	DIGITAL LOGIC AND MICROPROCESSORS	L	T	P	C
		3	0	2	4

MODULE I BOOLEAN ALGEBRA AND LOGIC GATES **12 Hours**

Boolean algebra: Boolean postulates and laws – SOP and POS – k-map – Quine Mc-Cluskey method.

Logic gates: AND, OR, NOT, NAND, NOR and XOR gates.

MODULE II COMBINATIONAL LOGIC CIRCUITS **12 Hours**

Introduction – adder – subtractor – code converter – multiplexer and de-multiplexer – parity checker and generator – magnitude comparator.

MODULE III SEQUENTIAL CIRCUITS **12 Hours**

Synchronous sequential circuits: Latches – flip flops – characteristic table and equation – realization of one flip flop using other flip flop – synchronous counter design.

Asynchronous sequential circuits: Difference between synchronous and asynchronous circuits – asynchronous counter design – static and dynamic hazards.

MODULE IV MICROPROCESSOR 8085 AND 8086 **12 Hours**

8085: Introduction – pin diagram – architecture – addressing modes – instruction set – assembly language programming.

8086: Pin diagram – architecture – addressing modes – instruction set – assembly language programming.

MODULE V 8051 MICROCONTROLLER AND I/O INTERFACING **12 Hours**

8051: Pin diagram – architecture – addressing modes – instruction set – assembly language programming.

I/O interfacing: Serial and parallel interfacing – D/A and A/D converter.

Experiments:

Digital:

1. Study of logic gates.
2. Design of adder and subtractor.
3. Design of code converters.
4. Implementation of MUX and DEMUX.
5. Implementation of parity checker and generator.
6. Design of synchronous and asynchronous counter.

Microprocessor:

1. Basic arithmetic operations – 8085.
2. Sorting of an array in ascending and descending order – 8085.
3. Stepper motor interfacing – 8085.
4. Basic arithmetic operations – 8086.
5. Floating point operations – 8086.
6. Arithmetic operations – 8051.

TOTAL: 60 HOURS

REFERENCES:

1. John F. Wakerly, “Digital design”, Fourth edition, Pearson/PHI, 2008.
2. Thomas L. Floyd, “Digital fundamentals”, 10th edition, Pearson Education Inc, 2011.
3. Donald D. Givone, Digital Principles and Design”, TMH, 2003.
4. Ramesh Gaonkar, “Microprocessor architecture, programming and applications with 8085”, 5th edition, Penram International Publishing, 2000.
5. Barry B. Brey, “The intel microprocessors, 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium pro processor, Pentium II, Pentium III, Pentium IV, architecture, programming interfacing”, 6th edition, Pearson education/PHI, 2002.
6. Mohamed Ali Mazidi, Janice GillispieMazidi, RolinMcKinlay, “The 8051 Microcontroller and Embedded systems: Using Assembly and C”, Second edition, Pearson education, 2011.

1902CS351

DATA STRUCTURES LAB

L	T	P	C
0	0	2	1

LIST OF EXPERIMENTS:

1. Write a program to implement Singly Linked List
2. Write a program to implement Stack using Array and Linked List
3. Write a program to implement Queue using Array and Linked List
4. Write a program to implement conversion of Infix Expression to Postfix Expression.
5. Write a program to sort a set of elements using bubble sort, insertion sort, shell sort, merge sort and quick sort
6. Write a program to implement searching using linear search and binary Search.
7. Write a program to Implement Binary Search Tree
8. Write a program to Implement Tree traversal Techniques
9. Write a program to Implement Minimum Spanning Tree using Prims and Kruskal Algorithm.
10. Write a program to Implement Shortest Path using Dijkstra's algorithm.

Total: 30 Hours

REFERENCES:

1. www.cs.cf.ac.uk/Dave/C/
2. <http://www.lysator.liu.se/c/bwk-tutor.html>
3. http://en.wikibooks.org/wiki/Data_Structures/Introduction
4. <http://www.eskimo.com/~scs/cclass/notes/top.html>

1902CS352	OBJECT ORIENTED PROGRAMMING LAB	L	T	P	C
		0	0	2	1

LIST OF EXPERIMENTS:

1. Write a C++ program using Static Data Members
2. Write a C++ program to implement the Multiple constructor in a class
3. Write a C++ program to implement Operator overloading for Unary and binary operator
4. Write a C++ program to implement Constructor in derived classes
5. Write a Java program to implement Control Statements
6. Write a Java program to implement Multi-threaded programming
7. Write a Java program to implement Multiple Inheritance
8. Write a Java program to implement Polymorphism
9. Write a Java program to implement Exception handling in various cases
10. Write a program to implement various String methods in Java

Total: 30 Hours

REFERENCES:

1. <https://lecturenotes.in/practicals/19363-lab-manuals-for-object-oriented-programming>
2. <http://studentsfocus.com/cs6461-object-oriented-programming-lab-manual>
3. <http://bietbvrn.ac.in/public/testimonia>
4. <http://www.srmuniv.ac.in/sites/default/files>

1904GE351

LIFE SKILLS: SOFT SKILL

L	T	P	C
0	0	2	1

MODULE I INTRODUCTION TO SOFT SKILLS

6 Hours

Soft Skills an Overview - Basics of Communication – Body Language – Positive attitude –Improving Perception and forming values – Communicating with others.

MODULE II TEAM VS TRUST

6 Hours

Interpersonal skills – Understanding others – Art of Listening - Group Dynamics –Essential of an effective team - Individual and group presentations - Group interactions – Improved work Relationship .

MODULE III SELLING ONESELF

6 Hours

How to brand oneself – social media – job hunting – Resume writing – Group Discussion – Mock G.D - .Interview skills – Mock Interview

MODULE IV CORPORATE ETIQUETTE

6 Hours

What is Etiquette – Key Factors – Greetings – Meeting etiquette – Telephone etiquette – email etiquette – Dining etiquette – Dressing etiquette .

MODULE V LEARNING BY PRACTICE

6 Hours

My family-Myself-Meeting people-Making Contacts.-A city-Getting about town-Our flat-Home life-Travelling - Going abroad- Going through Customs-At a hotel-Shopping- Eating out- Making a phone call- A modern office-Discussing business.

TOTAL: 45 HOURS

REFERENCES:

- 1 Dr.k.Alex, “soft skills “Third Edition, S.Chand& Publishing Pvt Limited, 2009
2. Arunakoneru, ‘Professional Communication’ Second Edition, Tata McGraw-Hill Education, 2008
3. D.K.Sarma,’You & Your Career ‘First Edition Wheeler Publishing & Co Ltd, 1999
4. Shiv Khera ‘You Can Win’ Third Edition Mac Millan Publisher India Pvt Limited, 2005