SACRED HEART COLLEGE (AUTONOMOUS)

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Ready for Everv Good Work

A Don Bosco Institution of Higher Education, Founded in 1951 * Affiliated to Thiruvalluvar University, Vellore * Autonomous since 1987

Accredited by NAAC (4th Cycle – under RAF) with CGPA of 3.31 / 4 at 'A+' Grade

Sacred Heart College (Autonomous), Tirupattur District

1.2.1 List of New Courses

B. Sc. Computer Science

Sem	Part	Subcode	Subtitle	Hours	Credits
1	I	LT114	Tamil – I	5	3
	II	LE115AT	English –I	5	2
	III	AM114C	Allied Mathematics -I	6	5
	III	CS120	Problem Solving Techniques	3	3
	III	CS121	Web Development Using HTML	4	4
	IV	VE105A/B	Christian Religion –I / Value Education –I	2	1
	IV	SK104	Communication Skills	2	1
	IV	CE103	Communicative English –I	-	1
	II	LE115AP	English Lab –I	-	1
	III	PCS108	Practical -I: Web Development Using HTML	3	2
2	I	LT214	Tamil –II	5	3
	II	LE215AT	English –II	5	2
	III	AM214C	Allied Mathematics –II	6	5
	III	CS221	Digital Computer Fundamentals	3	3
	III	CS222	Programming Using C	4	4
	IV	VE205A/B	Christian Religion –II / Value Education –II	2	1
	IV	SK204	Leadership Skills	2	1
	IV	CE203	Communicative English –II	-	1

	II	LE215AP	English Lab –II	-	1
	III	PCS212	Practical -II: Programming Using C	3	2
3	I	LT312	Tamil –III	5	3
	II	LE309T	English –III	5	2
	III	AP309B	Allied Physics for Computer Science I	4	3
	III	CS322	Computer Organization And Architecture	3	3
	III	CS323	Data Structures and Algorithms Using C	4	4
	IV	VE306	Human Rights	2	1
	IV	SK304	Technical Skills	2	1
	III	PCS309	Practical -III: Data Structures And Algorithms Using C	3	2
	II	LE309P	English Lab –III	-	1

Sem	Part	Subcode	Subtitle	Hours	Credits
4	I	LT411P / SS	Tamil -IV :Poem / Short Story	5	3
	II	LE409T	English –IV	5	2
	III	AP409B	Allied Physics For Computer Science II	4	3
	III	CS422	Software Engineering	3	3
	III	CS423	Relational Database Management Systems	4	4
	IV	VE406	Environmental Science	2	1
	IV	SK404	Employability Skills	2	1
	III	PAP409B	Allied Physics Practical's for Computer Science	2	1
	III	PCS412	Practical -IV: Relational Database Management Systems	3	2
	II	LE409P	English Lab –IV	-	1
	V	CO-SHE	Co-Curricular – Groups and Movements	-	2
	V	CO-DED	Co-Curricular – Outreach	-	2
5	III	CS540	Programming Using Java	4	4
	III	CS541	Web Development Using XML	4	4
	III	CS542	Programming Using PHP	3	3
	III	CS4543	Operating Systems	4	4
	III	CS544 A / B / C /D	Elective I : Computer Graphics / Data Mining And Warehousing / Decision Support System / Software Testing And Quality Assurance	4	4
	III	PCS515	Practical -V :Programming Using Java	3	2
	III	PCS516	Practical -VI :Web Development Using XML	3	2
	III	PCS517	Practical -VII :Programming Using PHP	3	2
	III		Non Major Elective -I	2	1
6	III	CS633	Mobile Applications Development	4	4
	III	CS634	Linux and Shell Programming	4	4
	III	CS635	Programming Using Python	3	4
	III	CS636	Microprocessor Using 8086/88	4	4

	III	CS637 A / B / C /D	Elective II :Computer Networks / Software Project Management / Security Systems / Cognitive Computing	4	4
	III	PCS627	Practical - VIII :Mobile Applications Development	3	2
	III	PCS628	Practical -IX :Programming Using Python	3	2
	III	PCS629	Practical -X :Linux and Shell Programming/Microprocessor Using 8086/88	3	2
	III	PCS630J	Project Work	-	4
	III		Non Major Elective II	2	1

Sacred Heart College (Autonomous), Tirupattur District

1.2.1 List of New Courses

Department: B.Sc. Computer Science

S. No	Course Code	Course Name
1.	CS120	Problem Solving Techniques

PROBLEM SOLVING TECHNIQUES

1. **Learning Objectives**

   - To develop problem solving skills with top down design principles.

   - To become competent in algorithm design and program implementation.

   - To develop skills to apply appropriate standard methods in problem solving

2. **Blue Print of the Question Paper**

Section	Unit-I	Unit-II	Unit-III	Unit-IV	Unit-V
Section-A	1-2	3-4	5-6	7-8	9-10
Section-B	11. a)Theory (or) b) Theory	12. a) Theory (or) b) Theory	13. a) Theory (or) b) Algorithm	14. a) Theory (or) b) Algorithm	15.a) Theory (or) b) Algorithm
Section-C	16. Theory	17. Theory	18. Theory	19. Theory (or) Program	20. Theory (or) Program

3. **Course Outline**

UNIT – I: INTRODUCTION TO COMPUTER PROBLEM SOLVING

Introduction – Problem Solving Aspect – Implementation of Algorithms – Program verification – Efficiency of Algorithms – Analysis of Algorithms.

UNIT – II: FUNDAMENTAL ALGORITHMS

Exchanging the Values of Two Variables – Counting – Summation of a Set of Numbers – Factorial Computation – Generation of The Fibonacci Sequence – Base Conversion

UNIT – III: FACTORING METHODS

Finding the Square Root of a Number – Smallest Divisor of an Integer – GCD of Two Integer – Generating Prime Numbers – Generation of Pseudo-Random Numbers

UNIT – IV: ARRAY TECHNIQUES

Array Order Reversal – Finding Maximum Number in a Set – Removal of Duplicates from an Ordered Array

UNIT – V: MERGING, SORTING AND SEARCHING

Two-way Merge, Sorting by Exchange, Binary Search, Hash Searching.

4. Teaching Resources

i. Text

1. Dromey R G, "How to Solve it by Computer", Dorling Kindersley India Pvt.Ltd, Pearson Education, 2007.

   Unit - I   : **Ch. 1.1, 1.2, 1.4, 1.5, 1.6, 1.7**

   Unit - II   : **Ch. 2.1, 2.2, 2.3, 2.4, 2.6, 2.8.**

   Unit - III : **Ch. 3.1, 3.2, 3.3, 3.4, 3.6.**

   Unit - IV   : **Ch. 4.1, 4.3, 4.4.**

   Unit - V   : **Ch. 5.1, 5.3, 5.7, 5.8**

ii. References

1. Michael Schneider, Steven W. Weingart, David M. Perlman, "An Introduction to Programming and Problem Solving with Pascal", Wiley Eastern Limited, New Delhi, 1982.

2. Harold Abelson and Gerald Sussman with Julie Sussman, "Structure and Interpretation of Computer Programs", MIT Press, 1985.

3. Ronald A. Pasko, "Problem Solving Basics and Computer Programming", Jones And Bartlett Publishers, 2nd Edition, 2001.

iii. Web references

Online Tutorial

1. http://nptel.ac.in/courses/106104074/
2. http://javahungry.blogspot.com/2014/06/algorithm-problem-solving-techniques-or approaches-for-software-programmer.html

Online Quiz

1. https://www.tutorialspoint.com/cplusplus/cpp_online_quiz.htm

2. http://www.withoutbook.com/OnlineTestStart.php?quizId=11

Online Compiler

1. https://www.tutorialspoint.com/compile_cpp11_online.php
2. https://www.codechef.com/ide

5. **Learning Outcomes**

Upon Completing the Course, Students will be able to:

- Develop programming techniques required to solve a given problem.
- Develop problem solving skill using top – down design principles.
- Design an algorithm for a problem.
- Develop techniques to handle array structure
- Develop techniques such as searching and sorting