SYLLABUS FOR STUDENTS ADMITTED IN JULY, 2011.

B.Sc. COMPUTER SCIENCE

STRUCUTRE OF THE COURSE

Course Code	Course Name	L	P	C
I SEMESTER				
SHCS101	Language -I (Tamil / Hindi / French)	5	0	5
SHCS102	English -I	5	0	5
SHCS103	Problem Solving Techniques	5	0	5
SHCS104	Computer Organization & Architecture	5	0	5
SHCS105	Allied : Mathematics – I	5	0	5
SHCS106	Computer Organization Lab	0	3	2
SHCS107	Communication Skills (Internal Assessment Only)	2	0	2
II SEMESTER				
SHCS201	Language -II (Tamil / Hindi / French)	5	0	5
SHCS202	English -II	5	0	5
SHCS203	Structured and Object Oriented Programming	5	0	5
SHCS204	Operating Systems	5	0	5
SHCS205	Allied : Mathematics – II	5	0	5
SHCS206	Structured and Object Oriented Programming Lab	0	3	2
SHCS207	Value Education (Internal Assessment Only)	2	0	2

Skill Development Courses (Internal Assessments Only):

Maximum Marks: 100

Semester I - Communications Skills

Semester II – Value Education

Note:

The Assessment of the above courses will be done by assigning seminars, assignments, group discussions, Class Tests and etc.

I YEAR – I SEMESTER

PROBLEM SOLVING TECHNIQUES

Unit – I: PROGRAMMING TECHNIQUES

Steps Involved in Computer Programming – Problem Definition – Outlining The Solution – Flow Chart – Developing Algorithms – Efficiency of Algorithms - Analysis of Algorithms.

Unit – II: FUNDAMENTAL ALGORITHMS

Exchanging the Values – Counting – Summation of Set of Number – Factorial Computation – Sine Computation – Fibonacci Sequence – Reversing the Digits of an Integer – Base Conversion – Character to Number Conversion.

Unit – III: FACTORING METHODS

Finding the Square Root of a Number – Smallest Divisor of an Integer – GCD of Two Integers – Generating Prime Numbers – Computing the Prime Factors of an Integer – Generation of Pseudo-Random Numbers – Raising a Number to a Large Power – Computing the Nth Fibonacci Number.

Unit – IV: ARRAY TECHNIQUES

Array Order Reversal – Array Counting or Histogramming – Finding the Maximum Number in a Set – Removal of Duplicates from an Ordered Array – Partitioning an Array – Finding the k^{th} Smallest Element – Longest Monotone Subsequence.

Unit – V: MERGING, SORTING AND SEARCHING

Two Way Merge - Sorting by Selection, Exchange, Insertion, and Partitioning - Binary Search – Hash Searching.

TEXTBOOK

1. Dormer R G, “How to Solve it by Computer”, Prentice Hall of India, 1997

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.

I YEAR – I SEMESTER

COMPUTER ORGANIZATION & ARCHITECTURE

UNIT I: INTRODUCTION TO DIGITAL DESIGN

Data Representation – Data Types – Complements (signed and unsigned numbers) – Types of Binary Codes – Signed and unsigned numbers - Binary Addition, Subtraction Multiplication, Division, - Logic Gates - Boolean algebra - Map Simplification (up to 4 variable maps): SOP, POS, Don't Care conditions.

UNIT II: DIGITAL COMPONENTS - REGISTER TRANSFER & MICRO OPERATIONS

Combination Circuits: Half-Adder, Full Adder- Flip Flops – Sequential Circuits - ICs : Decoders ,Encoders, Multiplexers, Registers, Shift Registers, Binary Counters – Sequential circuits - Memory Hierarchy – Types of Memory Unit.

UNIT III: I/O AND MEMORY ORGANIZATION

Peripheral Devices – Input-Output Interface – Asynchronous Data Transfer: Handshaking – Serial Transfer – Communication Interface – Modes of Transfer – Priority Interrupt – DMA – Serial Communication- Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory – Memory Management Hardware.

UNIT IV: MICROPROCESSOR

Introduction to micro computers, microprocessors and Assembly languages - Microprocessor architecture and its operations - 8085 MPU - 8085 instruction set and classifications.

UNIT V: ASSEMBLY PROGRAMMING

Writing assembly levels programs - Programming techniques such as looping, counting and indexing addressing nodes - Data transfer instructions - Arithmetic and logic operations - Dynamic debugging. Stack – subroutine - conditional call and return instructions.

TEXTBOOK

Unit I - III

1. Morris M Mano, “Computer System Architecture”, Prentice Hall of India, 3rd Edition, 2008.

Unit IV, V

2. R. S. Gaonkar, “Microprocessor Architecture. Programming and Applications with 8085/8080A”, Wiley Eastern limited. 1990.

REFERENCES

1. John. P. Hayes, “Computer Architecture and Organization”, Tata McGraw Hill, 1996
2. Hamacher V C , “Computer Organization”, Tata McGraw Hill,1996
3. Douglas v. Hall, “Microprocessors and Interfacing Programming and hardware”, TATA McGraw Hill, 1999.
4. A. Mathur,”Introduction to Microprocessor”, Third Edition, Tata McGraw-Hill Publishing Co.Ltd. 1993.

I YEAR – I SEMESTER

MATHEMATICS - I

UNIT-I:

ALGEBRA: Partial fractions, Binomial, Exponential and Logarithmic Series (Without proof), summation and approximate problems.

UNIT II:

MATRICES: Symmetric, skew-symmetric, Hermitian, skew-Hermitian, Orthogonal, Unitary matrices. Rank– Consistency – Eigenvalues – Eigen vectors – Cayley – Hamilton Theorem (without proof) – Inverses.

UNIT III:

THEORY OF EQUATIONS: Polynomial equations, irrational roots, complex roots, Reciprocal equations, Approximation of roots of a polynomial equation by Newton and Horner's methods.

UNIT IV:

DIFFERENCIAL CALCULUS: n^{th} derivatives – Leibnitz Theorem – Jacobians – radius of curvature (Cartesian Coordinates) – Maxima and minima of functions of two variables.

UNIT V:

TRIGONOMETRY: Expansions of Sinnθ, Cosnθ,Tannθ. Expansions of Sinnθ, Cosnθ, SinnθCosnθ, Hyperbolic and inverse hyperbolic functions.

Books for study and references:

Dr.P.R.Vittal : Allied Mathematics
Singaravelu.A : Allied Mathematics
Manikavasagam piallai and Narayanan : Ancillary Mathematics.

Treatment as in “Allied Mathematics” by P.R.Vittal

Unit I: Chaps.1, 2, 3, 4

Unit II: Chap.5 (Similarity of matrices excluded)

Unit III: Chap.6 (above mentioned topics only)

Unit IV: Chap.7, Chap.9 (sec.3, 4 and XChap.11- Excluding Radius of curvature in pole form

Unit V: Chap.14 (Excluding logarithm of complex numbers, Gregory’s series and summation of series)

I YEAR – I SEMESTER

COMPUTER ORGANIZATION LAB

DIGITAL LAB

I. Study of Logic Gates

Logic gates using discrete components.

1. Verification of truth table for AND, OR, NOT, NAND, NOR and XOR gates
2. Realization of NOT, AND, OR, EX-OR gates with only NAND gates.
3. Realization of NOT, AND, OR, EX-OR gates with only NOR gates.

II. Implementation of Logic Circuits

1. Verification of Associative law for AND, OR gates.
2. Karnaugh's Map reduction and logic circuit implementation.

III. Adder and Subtractor

1. Verification of Demorgan's law
2. Implementation of Half – Adder and Half – Subtract or.
3. Implementation of Full – Adder and Full – Subtract or.
4. Four bit Binary Adder.
5. Four bits Binary Subtractor using 1s and 2s Complement.

IV. Shift Registers

1. Implementation of Shift Registers, Serial Transfer.
2. Ring Counter.
3. 4 – Bit binary counter.
4. BCD Counter Counters for arbitrary sequence.

MICROPROCESSOR LAB

I) ADDITION AND SUBTRACTION

1. 8 – bit addition
2. 16 – bit addition
3. 8 – bit subtraction
4. BCD subtraction

II) MULTIPLICATION AND DIVISION

1. 8 – bit multiplication
2. BCD multiplication
3. 8 – bit division

III) SORTING AND SEARCHING

1. Searching for an element in an array.
2. Sorting in ascending order.
3. Finding largest and smallest elements from an
4. Reversing array elements
5. Block move
6. Sorting in descending order.

IV) CODE CONVERSION

1. BCD to Hex and Hex to BCD
2. Binary to ASCII and ASCII to binary
3. ASCII to BCD and BCD to ASCII

V) APPLICATIONS

1. Square of a single byte Hex number
2. Square of a two digit BCD number
3. Square root of a single byte Hex number
4. Square root of a two digit BCD number

I YEAR – II SEMESTER

STRUCTURED AND OBJECT ORIENTED PROGRAMMING

Unit – I: STRUCTURED PROGRAMMING – I

Programming Languages – Programming Paradigms - Background of C++ - First Program in C++ - Structure of C++ Program - Data Types - Basic Data Types – User Defined Data Types– Expressions – Tokens, Keywords and Identifiers – Constants and Variables - Operators– Statements – Assignment - Input Output Objects – Manipulators -Control Structures – Selection Statement – Iteration Statements – Arrays and Strings.

Unit – II: STRUCTURED PROGRAMMING - II

Structures, Unions and Enumerations – Functions – Function Prototyping – Call by Value, Call by Reference- Inline Functions- Recursion - Pointers - Default Arguments - Passing arrays to Functions – Passing Structures to Functions – Function Overloading – Using Pointers as Function Arguments and Parameters - File I/O – File Classes – File Operations – Random Access

Unit – III: CLASSES AND OBJECTS

Characteristics of Object Orient Programming - Classes and Objects – Data Members - Member Functions - Constructors and Destructors – Friend Functions – Friend Classes – Static Class Members – Object Pointers.

Unit – IV: INHERITANCES AND POLYMORPHISM

Operator Overloading – Inheritance – Protected Members – Inheriting Multiple Base Classes – Virtual Base Classes – Polymorphism – Virtual Functions – Virtual Base Classes – Dynamic versus Static Binding.

Unit – V: TEMPLATES AND EXCEPTION HANDLING

Templates – Generic Functions – Applying Generic Functions – Generic Classes - Exception handling – Standard Template Library – Container Classes – Lists – Maps – Algorithms – String.

TEXTBOOK

1. Balagurusamy E, “Object Oriented Programming with C++”, Tata McGraw Hill, 2006.

REFERENCES

1. Andrew C. Staugaard JR, “Structured and Object-Oriented Problem Solving Using C++”, Third Edition, Prentice Hall, 2002.
2. Herbert Schildt, “C++: The Complete Reference”, Third Edition, Tata McGraw Hill, 1999
3. Yashavant Kanethkar, “Let us C++”, BPB Publications, 1999.
4. Bruce Eckel, “Thinking in C++”, Second Edition, Pearson Education, 2001.

I YEAR – II SEMESTER

OPERATING SYSTEMS

Unit – I: INTRODUCTION

Definition -Mainframe System-Desktop Systems-Multi processor System-Distributed-Clustered-Real time Systems-Handheld Systems-Operating System Structure-System Components-Services-System Calls-System Programs-System Design and Implementation

Unit – II: PROCESS MANAGEMENT

Concepts-Process Scheduling-Operations on Processes-Co-operating Processes-Inter Process Communication-CPU Scheduling-Scheduling Concepts-Criteria-Scheduling Algorithms-Multiprocessor Scheduling-Real time Scheduling

Unit – III: PROCESS SYNCHRONIZATION

Critical Section-Synchronization Hardware-Semaphores-Problems of Synchronization-Critical Regions-Monitors-Deadlocks-Characterization-Handling Deadlocks-Deadlock Prevention-Avoidance-Detection-Deadlock Recovery

Unit – IV: MEMORY MANAGEMENT

Storage Hierarchy-Storage Management Strategies-Contiguous-Non Contiguous Storage Allocation-Single User-Fixed Partition-Variable Partition-Swapping-Virtual Memory-Basic Concepts-Multilevel Organization-Block Mapping-Paging-Segmentation-Page Replacement Methods-Locality-Working Sets

Unit – V: I/O AND FILE SYSTEMS

Disk Scheduling-File Concepts-File System Structure-Access Methods-Directory Structure-Protection-Directory Implementation-Allocation Methods-Free Space Management-Case Study: Linux System

TEXT BOOK

1. Silberschatz and Galvin, "Operating System Concepts", 6th Edition, John Wiley & Sons, Inc., 2004

REFERENCES

1. Milankovic M, "Operating System Concepts and Design", 2nd Edition, McGraw Hill, 1992
2. P.C.Bhatt, "An Introduction to Operating Systems-Concepts and Practice", Prentice Hall Of India, 2004
3. H.M.Deitel, "An Introduction to Operating Systems", 2nd Edition, Pearson Education, 2002

I YEAR – II SEMESTER

MATHEMATICS - II

UNIT-I:

Integral calculus- polynomial and irrational function- Bernoulli's formula – reduction formula - $\int \sin^n x\, dx$ - $\int \cos^n x\, dx$.

UNIT- II:

Fourier series [0,2л] and [-л, л] – multiple integral – Double- change of order of integration.

UNIT – III:

Differential Equation: Second order Differential Equation with constant coefficient. Partial Differential Equation: Eliminating arbitrary constants and functions – four standard types.

UNIT – IV:

Laplace Transformation – basic properties and simple problems – L $[e^{at}f(t)]$ – L $[t^n f(t)]$- L $[e^{at}t\, f(t)]$ –L $[f(t)/t]$

UNIT – V:

Inverse Laplace transformation – solving differential equation using Laplace Transformation.

BOOKS FOR REFERENCE:

1. A.SINGARAVELU: ALLIED MATHEMATICS
2. A. MANICKAVASAGAM PILLAI AND NARAYANAN: ANCILLARY MATHEMATICS.

Treatment as in "Mathematical Foundation" by DR.P.R.VITTAL

Unit-I: Chap.15 (15.1 to 15.28), Chap.16 (16.1 to 16.8)

Unit-II: Chap.21 (21.1 to 21.40), Chap.20 (20.1 to 20.17, 20.23 to 30.32)

Unit III: Chap.23 (23.1 to 23.36), Chap.26 (26.1 to 26.40)

Unit IV: Chap.27 (27.1 to 27.19)

Unit-V: Chap.27 (27.25 to 27.54)

I YEAR – II SEMESTER

STRUCTURED AND OBJECT ORIENTED PROGRAMMING LAB

PROGRAMMING

1. Data types, Expressions, Control structures and I/O
2. Arrays
3. String Handling
4. Functions, Inline functions and default arguments
5. Function overloading
6. Pointers
7. Classes and Objects
8. Friend functions and friend classes
9. Static members
10. Operator Overloading
11. Inheritance
12. Virtual functions
13. Exception Handling
14. Files
15. Templates and STL

Note: Practical exercises should be in the ratio of 40% for Structured Programming and 60% for Object-oriented programming.

I YEAR - I SEMESTER

COMMUNICATION SKILLS

(Internal Assessment Only)

UNIT I - BASIC ENGLISH

Introduction to English Language- Alphabets: Types, Explanations, Examples, Exercise- Introduction to Phonetics- Application of Phonetics- Silent Consonants, Rules to identify the silent consonants in a want- Conversion of mother tongue to English language- Direct translation of words and essential phrases to English language- Short conversations.

UNIT - II GRAMMAR AND USAGE OF GRAMMAR

Introduction to Grammar – Sentences: Types, Examples, And Exercise- Nouns: Noun Gender, Types, Examples, And Exercise – Pronouns: Types, Examples, And Exercise – Verb: Types, Examples, And Exercise – Adjectives: Types, Examples, And Exercise – Adverb: Types, Examples, Exercise – Preposition – Conjunction – Interjection – Articles.

UNIT III - TENSES

Introduction to tenses – Types of tenses – Framing sentences using tenses – Application of tenses – Active voice and passive voice – Direct speech and indirect speech – Idioms and Phrases – Frequently used Phrasal Verbs.

UNIT IV - ADVANCED ENGLISH

Greetings – Requests – Demands – Instructions – Enquiries – Behavior Norms – Listening – Telephone Etiquette – Giving Information – Situational Conversations – Basics of Accent: American and Neutral{British}.

UNIT V - WRITTEN COMMUNICATION

Sending Messages – General formats of writing a letter – Telegraphic Messages – Writing for occasions – Types of letters: Personal, Business, Proposal, Applications, Thanks, Invitation, Condolence, Requisition, and Complaint.

TEXT BOOKS

John Seely, “Oxford A-Z of Grammar and Punctuation”, Oxford University Press, YMCA library building, 3rd edition, NewDelhi 110001, 2007.

Jeremy Butterfield, “Oxford A-Z of English usage”, Oxford University Press, YMCA library building, 3rd edition, NewDelhi 110001, 2007.

Dr.V.H.Baskaran, “English Made Easy”, Shakespear Publication, 6th edition, Chennai 2007.

Dr.V.H.Baskaran, “Spoken English Made Easy”, Shakespeare Publication, 6th edition, Chennai 2007.

Dr.J.John Love Joy, Dr.Francis M.Peter S.J, “Lets Communicate – Basic English for everyone”, Vaigarai publications, 1st edition, Dindigul 2007.

WREN & Martin’s “ High School English Grammar and Composition”, Revised by N.D.V Prasada Rao, , S.Chand & company Ltd., 10th edition, NewDelhi 2010.

Penny Ur, “Grammar Practice Activities”, Cambridge University Press, 4th edition, 2006.

Kenna Bourke, “Test It, Fix It – Intermediate English Grammar”, Oxford UK, 10th edition, 2008.

I YEAR - II SEMESTER

VALUE EDUCATION

(Internal Assessment Only)

PURPOSE

To provide guiding principles and tools for the development of the whole person, recognizing that the individual is comprised of Physical Intellectual, Emotional and Spiritual dimensions.

INSTRUCTIONAL OBJECTIVES

- To help individuals think about and reflect on different values
- To deepen understanding, motivation and responsibility with regard to making personal and social choices and the practical implications of expressing them in relation to themselves, others, the Community and the world at large
- To inspire individuals to choose their own personal, social, moral and spiritual values and be aware of practical methods for developing and deepening them

Value Education-Introduction - Definition of values - Why values? - Need for Inculcation of values - Object of Value Education - Sources of Values - Types Values:

- Personal values
- Social values
- Professional values
- Moral and spiritual values
- Behavioral (common) values

Personal values - Definition of person - Self confidence - Self discipline - Self Assessment - Self restraint - Self motivation - Determination - Ambition - Contentment - Humility and Simplicity - Sympathy and Compassion - Gratitude -Forgiveness - Honesty - Courtesy.

Social values - Definition of Society - Units of Society - Individual, family, different groups - Community - Social consciousness - Equality and Brotherhood - Dialogue - Tolerance - Sharing - Responsibility - Cooperation Freedom - Repentance and Magnanimity.

Professional values - Definition - Competence - Confidence - Devotion to duty -Efficiency - Accountability - Respect for learning /learned - Willingness to learn-Open and balanced mind - Team spirit - Professional Ethic - Willingness for Discussion - Aims - Effort - Avoidance of Procrastination and slothfulness -Alertness.

Behavioral values - Individual values and group values - Good manners at home and outside - Equality - Purity of thought, speech and action - Understanding the role of religion - Faith - Understanding the commonness of religions - respect for other faiths - unity in diversity - Living together - Tolerance - Nonviolence - Truthfulness - Common aim - Unified effort towards peace - Patriotism.

REFERENCE BOOKS

- Dr. S. Ignacimuthu S. J., Values for life, Better yourself Books, Bandra Mumbai - 600 050 (1999)
- Values(Collection of Essays)., Published by : Sri Ramakrishna Math., Chennai - 4.,(1996)
- Prof. R.P.Dhokalia., Eternal Human Values NCRT - Campus Sri Aurobindo Marg., New Delhi - 110 011
- Swami Vivekananda., Education., Sri Ramakrishna Math., Chennai-4(1957)
- Tirukural (English Translation by Dr.G.U.Pope)
- The Bible
- The Kuran
- The Bagavath Geetha