<table>
<thead>
<tr>
<th>Year / Semester</th>
<th>Subject</th>
<th>Paper</th>
<th>Title of the Paper</th>
<th>Ins. Hrs/ Week</th>
<th>Credit</th>
<th>Exam hrs</th>
<th>IA</th>
<th>Uni. Exam.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Year I Semester</td>
<td>Core</td>
<td>Paper I</td>
<td>Object Oriented Programming using C++</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Core</td>
<td>Paper II</td>
<td>Computer Architecture and Parallel Processing</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Core</td>
<td>Paper III</td>
<td>Advanced DBMS</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Core Practical</td>
<td>Practical I</td>
<td>Object Oriented Programming using C++ Lab</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>40</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Core Practical</td>
<td>Practical II</td>
<td>Advanced DBMS Lab</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>40</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Elective I</td>
<td>Paper I</td>
<td>(a) Operating System [or] (b) Object Oriented Analysis and Design</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>I Year II Semester</td>
<td>Core</td>
<td>Paper IV</td>
<td>Data Communication and Networks</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Core</td>
<td>Paper V</td>
<td>Visual Programming</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Core</td>
<td>Paper VI</td>
<td>Microprocessor and its Applications</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Core Practical</td>
<td>Practical III</td>
<td>Visual Programming Lab</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>40</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Core Practical</td>
<td>Practical IV</td>
<td>Microprocessor Lab</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>40</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Human Rights</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Elective II</td>
<td>Paper II</td>
<td>(a) Embebed System [or] (b) Mobile Computing</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>II Year III Semester</td>
<td>Core</td>
<td>Paper VII</td>
<td>Design and Analysis of algorithms</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Core</td>
<td>Paper VIII</td>
<td>Internet and Java Programming</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Core</td>
<td>Paper IX</td>
<td>Data Mining and Warehousing</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Core Practical</td>
<td>Practical V</td>
<td>Internet and Java Lab</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>40</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>Year / Semester</td>
<td>Subject</td>
<td>Paper</td>
<td>Title of the Paper</td>
<td>Ins. Hrs/ Week</td>
<td>Credit</td>
<td>Exam hrs</td>
<td>Max. Marks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------</td>
<td>-----------</td>
<td>---------------------------------------------</td>
<td>----------------</td>
<td>--------</td>
<td>----------</td>
<td>------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Core Practical</td>
<td>Practical VI</td>
<td>Mini Project</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elective III</td>
<td>Paper III</td>
<td>(a) Network Security <em>(or)</em></td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(b) Principles of Complier Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elective IV (Non-Major Subject)</td>
<td>Paper IV</td>
<td>Multimedia and Animation</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II Year IV Semester</td>
<td></td>
<td></td>
<td>Project Work and <em>viva voce</em></td>
<td>30</td>
<td>12</td>
<td></td>
<td>50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total           |                           |           |                                             | 120            | 90     |          | 2200       |

* Two reviews are to be conducted during the period of Project Work
M.Sc. Computer Science : Syllabus (CBCS)

THIRUVALLUVAR UNIVERSITY

M.Sc. COMPUTER SCIENCE

SYLLABUS

UNDER CBCS

(with effect from 2008-2009)

I SEMESTER

PAPER I

OBJECT ORIENTED PROGRAMMING USING C++

UNIT-I
Introduction to OOP: Overview of C++ - classes - structures - union - friend function - friend class - inline function - constructors - static members - scope resolution operator - passing objects to functions - function returning objects

UNIT-II
Arrays - pointers - this pointer - references - dynamic memory allocation - functions overloading - default arguments - overloading constructors - pointers to functions

UNIT-III
Operator overloading - member operator function - friend operator function - type conversion - inheritance - types of inheritance - virtual base class - polymorphism - virtual function.

UNIT-IV
Class templates and generic classes - function templates and generic functions - overloading a function templates - power of templates - exception handling - derived class exception - exception handling functions
UNIT-V
Streams - formatted I/O with its class functions and manipulators - creating own manipulators - file I/O - conversion functions - standard template library.

Text Book

Reference
PAPER II

COMPUTER ARCHITECTURE AND PARALLEL PROCESSING

UNIT-I
Central Processing Unit: General Register and Stack Organization - Instruction formats - Addressing Modes - Data Transfer and Manipulation - Program Control - RISC - Pipelining - Arithmetic, Instruction and RISC Pipelining - Vector Processing - Array Processor.

UNIT-II
Input-Output organization - Peripheral devices - I/O Interface - Asynchronous Data Transfer - Modes of Transfer - Priority Interrupt - DMA - I/O Processor - Serial Communication - Memory Organization - Memory Hierarchy - Auxiliary Memory - Associative Memory and Virtual Memory

UNIT-III
Need for parallel computers, Modules of Computation, Analyzing Algorithms, Expressing Algorithms - Broadcast, All sum and selection algorithms and SIMD model - Searching a sorted sequence: EREW, CREW SMSIMD algorithms, Searching a Random sequence on shared memory SIMD, Tree and mesh interconnected computers.

UNIT-IV
Sorting on a Linear array, Sorting a Mesh, Sorting on EREW SIMD computer, MIMD Enumeration sort, MIMD Quick sort, Sorting on other Networks.

UNIT-V
Text Books

4. Selim G.AKL - The Design and Analysis of parallel Algorithms - PHI.

Reference

PAPER III

ADVANCED DBMS

UNIT-I

UNIT-II

UNIT-III

UNIT-IV

UNIT-V
Text Books

Reference
CORE PRACTICAL I

OBJECT ORIENTED PROGRAMMING USING C++ LAB

1. Classes and objects
2. Function overloading
3. Constructors
4. Friend function
5. Inline function
6. Operator overloading
7. Conversion function
8. Inheritance
9. Polymorphism
10. Files

CORE PRACTICAL II

ADVANCED DBMS (ORACLE) LAB

SQL
1. Simple Queries using DDL, DML and DCL
2. SQL Aggregate Functions
3. SET Operations
4. Views and Snapshots
5. Multiple Tables and Nested Queries

PL/SQL
6. PL/SQL Block
7. Function and Procedures
8. Subprograms and Packages
9. Triggers
10. Cursors

FORMS AND REPORTS
11. Designing Oracle Forms using Menus and Buttons
12. Developing Oracle Reports
ELECTIVE I

PAPER I

(to choose either A or B)

A) OPERATING SYSTEMS

UNIT-I

UNIT-II
Storage management: Real storage management strategies - contiguous versus non-contiguous storage allocation - single user contiguous storage allocation - fixed partition multiprogramming - variable partition multiprogramming - multiprogramming with storage swapping. Virtual storage: Virtual storage management strategies - page replacement strategies - working sets - demand paging - paging sets.

UNIT-III

UNIT-IV
UNIT-V


Text Book


References

B) OBJECT ORIENTED ANALYSIS AND DESIGN

UNIT-I
System Development - Object Basis - Development life cycle - Methodologies - Patterns - Frameworks - Unified Approach - UML

UNIT-II
Use - Case Models - Object Analysis - Object relations - Attributes - Methods - Class and object responsibilities - Case studies

UNIT-III
Design Process - Design Axioms - Class Design - Object storage - Object Interpretability - Case Studies

UNIT-IV
User interface design - View layer Classed - Micro - level processes - View Layer Interface - Case studies

UNIT-V

Text Book

Reference
Grady Booch ,” Object oriented Analysis and design “, Pearson Education ,2/e.
II SEMESTER

PAPER IV

DATA COMMUNICATION AND NETWORKS

UNIT-I

UNIT-II

UNIT-III

UNIT-IV
UNIT-V


Text Books


Reference

PAPER V

VISUAL PROGRAMMING

UNIT-I
Customizing a form - Writing a simple program - Tool box - Creating control - Name property_Command button - Access keys - Image control - Text boxes - Labels - Message boxes - Grid _Editing tools - Variables data types - String number.

UNIT-II
Displaying information-Determinate tools, Indeterminate tools - Conditionals built in function - Function and procedure.

UNIT-III
Alies - List - Sorting and searching record_control arrays - Grid control - Project with multiple form - Do events and sub main - Error traffic.

UNIT-IV

UNIT-V
Monitoring - Mouse activity - File and handling - File system control - File system objects - COM - Automation BCC servers - OLE drag and drop.

Text Books

Reference
PAPER VI

MICROPROCESSOR AND ITS APPLICATIONS

UNIT-I
Microcomputer, microprocessor and assembly language - microprocessor architecture and its operations - memory input/output - interfacing devices - 8085 based microcomputer system - addressing modes - instruction classification, format, timings and operation status.

UNIT-II
Instruction set - Data transfer instructions: Arithmetic operations - logic and branch operation - Looping, counting and indexing - 16 bit arithmetic instructions - arithmetic operation related to memory - logic operations: rotate, compare, counters and time delays.

UNIT-III

UNIT-IV
Basic concepts of advanced microprocessors - concepts of arithmetic coprocessor - The 80x87 architecture - Introduction to 80386 microprocessor - 80386 Memory management - The memory paging mechanism - Introduction to the 80486 microprocessor. Introduction to the Pentium Microprocessor.
UNIT-V

Microprocessor Applications: Interfacing keyboards, displays, A/D and D/A converters, stepper motor control.

Text Book


Reference

CORE PRACTICAL III

VISUAL PROGRAMMING LAB

1. Building simple application
2. Working with Intrinsic controls and ActiveX controls
3. Application with multiple forms
4. Application with dialogues
5. Application with menus
6. Application using data control
7. Application using format dialogues
8. Drag and Drop events
9. Database Management
10. Creating ActiveX controls

CORE PRACTICAL IV

MICROPROCESSOR LAB

1. Study of 8085 microprocessor.
2. Performing logical operations.
3. Performing 8 bit arithmetic operations.
4. Performing 16 bit arithmetic operations.
5. Finding the sum of N elements.
6. Finding maximum and minimum in an array
7. Conversion of hexadecimal number into binary number.
8. Sorting an array of numbers.
9. Finding number zeros, positive and negative numbers in an array.
10. Finding the square of a number using look up table.
11. Square wave generation using 8253.
13. Data transfer using USART.
UNIT-I

UNIT-II

UNIT-III

UNIT-IV

UNIT-V


Books for Reference:
2. Human Rights, Questions and Answers, UNESCO, 1982
3. Mausice Cranston - What is Human Rights
4. Desai, A.R. - Violation of Democratic Rights in India
5. Pandey - Constitutional Law.
7. Human Rights, A Selected Bibliography, USIS.
9. G.S. Bajwa - Human Rights in India.
10. Amnesty International, Human Rights in India.

Magazines:

1. The Lawyer, Bombay
2. Human Rights Today, Columbia University
3. International Instruments of Human Rights, UN Publication
ELECTIVE II

PAPER II
(to choose either A or B)

A) EMBEDDED SYSTEMS

UNIT-I
Introduction: Overview of dedicated and automated systems - their specific requirements - robust design - environmental issues - temporal constraints - technological constraints - software systems - product design cycle.

UNIT-II
Development of a System Specification: Evaluation - justification of the available levels of system integration (custom chip design through turnkey - systems) - technological choice.

UNIT-III
Software Issues: Development environment compilers - linkers - debuggers - emulators - real time operating systems - kernels - Designing and implementing code for dedicated systems.

UNIT-IV

UNIT-V
Transducers: Sensors for measuring physical phenomena - output devices such as power actuators - motors. Data transformation - signal conditioning - data conversion. The impact of EMC regulations on design practice.
Text Book


References

B) MOBILE COMPUTING

UNIT-I

UNIT-II

UNIT-III

UNIT-IV
Mobile Transport Layer: Traditional TCP - Indirect TCP - Snooping TCP - Mobile TCP - Fast retransmit/ Fast Recovery - Transmission/ Timeout Freezing - Selective Retransmission - Transaction Oriented TCP.

UNIT-V
Text Books

Reference
III SEMESTER
PAPER VII
DESIGN AND ANALYSIS OF ALGORITHMS

UNIT-I

UNIT-II

UNIT-III

UNIT-IV
Backtracking - General Method - 8 Queens Problem - Graph Coloring - Branch and Bound - Method - 0/1 Knapsack Problem

UNIT-V
Text Book

Reference
UNIT-I
Internet concepts - Internet services - Types of Accounts - Media for Internet - ISP - TCP/IP and connection software - Disconnecting from the internet - Dial-up Networking - Setting up and internet connection - Testing connection - Contenders - Issues in high-speed connection - Connecting via ISDN and cable modem

UNIT-II
E-mails - Downloading E-mails - Signatures and Stationery - Web based E-mail - E-mail tasks - Outlook express - Sending and Receiving files using Eudora - Outlook express and Pine - Multiple E-mail accounts - Sending from letters - Formatting e-mail - E-mail mailing lists.

UNIT-III
Servlet overview - The java web server - your first servlet - Servlet chaining - Server side includes - Session Management - Security - HTML forms - Using JDBC in servlets - Applet to servlet communication - The Software component assembly model - The java beans development kit - Developing beans - Notable beans - Using infobus - Glasgow developments

UNIT-IV
EJB architecture - EJB requirements - Design and implementation - EJB session beans - EJB entity beans - EJB Clients - Deployment - tips, tricks and traps for building distributed and other systems - Implementation and future directions of EJB.
UNIT-V
Variable in pearl - Pearl control structures and operators - Functions and Scope.

Text Books
5. Dustin T. Callway - Inside Servlets - Addison Wesley
7. Tomvalesky - Enterprise Java Beans - Addison Wesley
8. Cay G. Horstmann & Gary Cornell - Core Java - Vol II Advanced Features - Addison Wesley Pvt. Ltd. Indian Branch
PAPER IX
DATA MINING AND WAREHOUSING

UNIT-I
Introduction: Definition of data mining - data mining vs query tools - machine learning - taxonomy of data mining tasks - steps in data mining process - overview of data mining techniques.

UNIT-II

UNIT-III
Data Pre-Processing And Characterization: Data Cleaning - Data Integration and Transformation - Data Reduction - Discretization and Concept Hierarchy Generation - Primitives - Data Mining-Query Language - Generalization - Summarization - Analytical Characterization and Comparison - Association Rule - Mining Multi Dimensional data from Transactional Database and Relational Database.

UNIT-IV
Classification: Classification - Decision Tree Induction - Bayesian Classification - Prediction - Back Propagation - Cluster Analysis - Hierarchical Method - Density Based Method - Grid Based Method - Outlier Analysis.

UNIT-V
Cluster analysis: Types of data - Clustering Methods - Partitioning methods - Model based clustering methods - outlier analysis.

Advanced topics: Web Mining - Web Content Mining - Structure and Usage Mining - Spatial Mining - Time Series and Sequence Mining - Graph Mining.

Applications: Case studies in Data Mining applications
Text Books

2. Jiawei Han, Micheline Kamber, Data Mining: Concepts and Techniques, Morgan Kaufman Publishers, 2006.

Reference Books

PRACTICAL V
INTERNET AND JAVA LAB

1. Write programs in Java to demonstrate the use of following components: Text fields, buttons, Scrollbar, Choice, List and Check box.

2. Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout.

3. Write programs in Java to create applets incorporating the following features:
   - Create a color palette with matrix of buttons
   - Set background and foreground of the control text area by selecting a color from color palette.
   - In order to select Foreground or background use check box control as radio buttons
   - To set background images

4. Write programs in Java to do the following:
   - Set the URL of another server.
   - Download the homepage of the server.
   - Display the contents of home page with date, content type, and Expiration date. Last modified and length of the home page.

5. Write programs in Java using sockets to implement the following:
   - HTTP request
   - FTP
   - SMTP
   - POP3

6. Write a program in Java for creating simple chat application with datagram sockets and datagram packets.

7. Write programs in Java using Servlets:
   - To invoke servlets from HTML forms
   - To invoke servlets from Applets
8. Write programs in Java to create three-tier applications using servlets
   - for conducting on-line examination.
   - for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.

9. Create a web page with the following using HTML
   i) To embed a map in a web page
   ii) To fix the hot spots in that map
   iii) Show all the related information when the hot spots are clicked.

10. Create a web page with the following.
    i) Cascading style sheets.
    ii) Embedded style sheets.
    iii) Inline style sheets.
    iv) Use our college information for the web pages.
PRACTICAL VI

MINI PROJECT

Students are to take up sample project development activities with the guidelines given below:

- Preparing a project - brief proposal including
  - Problem Identification
  - Developing a model for solving the problem
  - A statement of system / process specifications proposed to be developed (Data Flow Diagram)
  - List of possible solutions including alternatives and constraints
  - Cost benefit analysis
  - Time line activities

- A report highlighting the design finalization [based on functional requirements & standards [if any]]

- A presentation including the following
  - Implementation phase (Hardware / Software / both)
  - Testing & Validation of the developed system
  - Learning in the project

- Consolidated report preparation
ELECTIVE III
(to choose either A or B)

PAPER III

A) NETWORK SECURITY

UNIT-I
Security attacks - security services - a model for internetwork security - conventional encryption model - steganography - the data encryption standard.

UNIT-II
Principles of public key cryptosystems - the RSA algorithm - key management - Diffie-Hellman key exchange - prime and relatively prime numbers - Fermat’s ad Eulers’s theorems - testing of primality - Euclid’s algorithm - the Chinese remainder theorem.

UNIT-III

UNIT-IV
Kerberos - pretty good privacy - S/MIME - IP security overview - IP security architecture - authentication header.

UNIT-V
Intruder - viruses and related threads - recommended reading - firewall design principles - trusted system.

Text Books
Reference

B) PRINCIPLES OF COMPILER DESIGN

UNIT-I
Lexical analysis: Regular expression-nondeterministic automata-deterministic automata- Equivalent to NFAs-minimizing the states of DFA-implementation of lexical analyzer.

UNIT-II
Syntax analysis: Top down parsing concepts-recursive descent parsing -predictive parsers - non recursive predicate parsing - bottom-up parsing - handle pruning - shift reduce parsing-operator parsing - LR parsers-parser generators -YACC.

UNIT-III
Intermediate code generation: Syntax directed definitions - construction of syntax trees - top down translation - bottom up evaluation of inherited attributed - recursive evaluators-assigning space at compiler construction time - type checking - overloading of functions and operators - polymorphic function.

UNIT-IV

UNIT-V
Text Book


Reference

ELECTIVE IV

PAPER IV

(NON MAJOR SUBJECT)

MULTIMEDIA AND ANIMATION

UNIT-I

UNIT-II

UNIT-III
Data and File Formats : RTF, TIFF, RIFF, MIDI, JPEG, AVI Video File Formats, MPEG Standards - TWAIN Architecture - Digital Audio and Video as Multimedia I/O Technology - Animation.

UNIT-IV

UNIT-V
Text Books


SEMESTER IV
PROJECT WORK AND VIVA VOCE

The objective of the project is to enable the students to work in a project of latest topic / research area / industrial applications. Each project student shall have a guide who is a faculty member.

During this semester the students are expected to do literature survey, formulate the problem and form a methodology of arriving at the solution of the problem. Also during this semester, the students are expected to complete the project and submit a full-fledged report comprising of the complete system developed along with implementation and test results. The departmental committee shall examine the students for 50 marks and the evaluation is based on continuous internal assessment comprising of two reviews.

After two reviews internal 50 marks (is based on seminar [20 marks], demo [20 marks] and internal viva-voce [10 marks]) will be given by the guide with the consultation of the departmental committee. At end of the semester, a viva-voce examination will be conducted for 150 marks (75 marks for internal examiner and 75 marks for external examiner).

******