

VELTECH HIGH TECH

**Dr RANGARAJAN Dr. SAKUNTHALA ENGINEERING
COLLEGE**

(Owned by Vel Trust 1997)

(An ISO 9001: 2008 Certified Institution)

**Accredited By NAAC with 'A' Grade and NBA Accredited
Institution**

**(Approved by AICTE New Delhi and Govt. of Tamil Nadu, Affiliated to
Anna University Chennai)**



SYLLABUS

WEEKLY SCHEDULE

V SEMESTER 2017-18

DEPARTMENT OF CSE

IV YEAR DEGREE COURSE

#42, Avadi – Vel Tech Road,
Avadi

Chennai – 600062

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INSTITUTION VISION AND MISSION

Accredited by NAAC with 'A' grade with an impressive score of 3.49.

INSTITUTION VISION

- Elevating well being of humanity by augmenting human resource potential through quality technical education and training

INSTITUTION MISSION

- To effectuate supremacy in technical education through articulation of research and industry practices for social relevance.
- To inculcate the habit of lifelong learning
- To exhibit professional ethics, commitment and leadership qualities

DEPARTMENT VISION

- To emerge as centre for academic excellence in the field of Computer Science and Engineering by exposure to research and industry practices

DEPARTMENT MISSION

- To provide good teaching and learning environment with conducive research atmosphere in the field of Computer Science and Engineering
- To propagate lifelong learning
- To impart the right proportion of knowledge, attitudes and ethics in students to enable them take up positions of responsibility in the society and make significant contributions

PROGRAMME EDUCATIONAL OBJECTIVES (PEOS)

The program educational objectives for the computer science and engineering program describe accomplishments that graduates are expected to attain within four years after graduation.

- Graduates applied their expertise for problem solving, be engaged professionally
- They will be motivated to continue to go for higher studies
- Graduates applied their expertise for problem solving, be engaged professionally
- They will contribute their organizations through leadership and teamwork.
- More specifically, within four years of graduation, the objectives are expertise, engage, leadership and teamwork
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PROGRAMME OUTCOMES (POS)

- Apply knowledge of mathematics, natural science, engineering fundamentals and system fundamentals, software development, networking & communication, and information assurance & security to the solution of complex engineering problems in computer science and engineering.
- Ability to identify, formulate and analyze complex Computer Science and Engineering problems in the areas of hardware, software, theoretical Computer Science and applications to reach significant conclusions by applying Mathematics, Natural sciences, Computer Science and Engineering principles.
- Design solutions for complex computer science and engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
- Ability to use research based knowledge and research methods to perform literature survey, design experiments for complex problems in designing, developing and maintaining a computing system, collect data from the experimental outcome, analyze and interpret valid/interesting patterns and conclusions from the data points.
- Ability to create, select and apply state of the art tools and techniques in designing, developing and testing a computing system or its component.
- Apply ethical principles and commit to professional ethics and responsibilities and norms of computer science and engineering practice.

WEEK DETAILS

SL.NO.	WEEK	FROM	TO
1	WEEK1	24.06.2017	25.06.2017
2	WEEK2	27.06.2017	02.07.2017
3	WEEK3	04.07.2017	09.07.2017
4	WEEK4	11.07.2017	16.07.2017
5	WEEK5	18.07.2017	23.07.2017
6	WEEK6	25.07.2017	30.07.2017
7	WEEK7	01.08.2017	06.08.2017
8	WEEK8	08.08.2017	13.08.2017
9	WEEK9	16.08.2017	20.08.2017
10	WEEK10	22.08.2017	27.08.2017
11	WEEK11	29.08.2017	03.09.2017
12	WEEK12	06.09.2017	10.09.2017
13	WEEK13	12.09.2017	17.09.2017
14	WEEK14	19.09.2017	24.09.2017
15	WEEK15	26.09.2017	01.10.2017
16	WEEK16	03.10.2017	08.10.2017
17	WEEK17	13.10.2017	15.10.2017
18	WEEK18	17.10.2017	22.10.2017

SUBJECT CONTENTS

SL.NO	SUBJECT CODE	SUBJECT NAME
THEORY		
1	MA6566	Discrete Mathematics
2	CS6501	Internet Programming
3	CS6502	Object Oriented Analysis and Design
4	CS6503	Theory of Computation
5	CS6504	Computer Graphics
PRACTICAL		
6	CS6511	Case Tools Laboratory
7	CS6512	Internet Programming Laboratory
8	CS6513	Computer Graphics Laboratory

TEST / EXAM SCHEDULE

SL.NO	SUBJECT CODE	SUBJECT NAME	UNIT TEST I	UNIT TEST II	Pre Model Exam	MODEL EXAM
1	MA6566	Discrete Mathematics	14.07.2017 FN	01.08.2017 FN	06.09.2017	04.10.2017
2	CS6501	Internet Programming	14.07.2017 AN	01.08.2017 AN	07.09.2017	06.10.2017
3	CS6502	Object Oriented Analysis and Design	15.07.2017 FN	02.08.2017 FN	08.09.2017	08.10.2017
4	CS6503	Theory of Computation	15.07.2017 AN	02.08.2017 AN	09.09.2017	13.10.2017
5	CS6504	Computer Graphics	16.07.2017 FN	03.08.2017 FN	10.09.2017	15.10.2017

MA6566 DISCRETE MATHEMATICS

UNIT I LOGIC AND PROOFS

WEEK 1: Propositional Logic – Propositional equivalences

WEEK 2: Predicates and Quantifiers – Nested Quantifiers

WEEK 3: Rules of inference - Introduction to proofs – Proof methods and strategy

UNIT II COMBINATORICS

WEEK 4: UNIT TEST-I

Mathematical induction – Strong induction and well ordering – The basics of counting

WEEK 5: The pigeonhole principle – Permutations and combinations – Recurrence relations

WEEK 6: Solving linear recurrence relations – Generating functions – Inclusion and exclusion principle and its applications.

WEEK 7: UNIT TEST-II

UNIT III GRAPHS

WEEK 8: Graphs and graph models – Graph terminology and special types of graphs

WEEK 9: Matrix representation of graphs and graph isomorphism – Connectivity – Euler and Hamilton paths

UNIT IV ALGEBRAIC STRUCTURES

WEEK 10:– UNIT TEST-III

Algebraic systems – Semi groups and monoids - Groups – Subgroups

WEEK 11: Homomorphism's – Normal subgroup and cosets – Lagrange's theorem

WEEK12: Definitions and examples of Rings and Fields

WEEK 13 : UNIT TEST-IV

WEEK 14 :- UNIT V LATTICES AND BOOLEAN ALGEBRA

Partial ordering – Posets – Lattices as posets – Properties of lattices

WEEK 15:– Lattices as algebraic systems – Sub lattices

WEEK 16: Direct product and homomorphism – Some special lattices – Boolean algebra

WEEK 17: MODEL EXAM

WEEK 18: MODEL EXAM

TEXT BOOK

1. Kenneth H.Rosen, "Discrete Mathematics and its Applications", 7th Edition, Tata Mc Graw Hill Pub. Co. Ltd., New Delhi, Special Indian Edition, 2011.
2. Tremblay J.P. and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata Mc Graw Hill Pub. Co. Ltd, New Delhi, 30th Reprint, 2011.

REFERENCES

1. Ralph.P.Grimaldi., "Discrete and Combinatorial Mathematics: An Applied Introduction", 4th Edition, Pearson Education Asia, Delhi, 2007.
2. Thomas Koshy., "Discrete Mathematics with Applications", Elsevier Publications, 2006.
3. Seymour Lipschutz and Mark Lipson., "Discrete Mathematics", Schaum's Outlines, Tata Mc Graw Hill Pub. Co. Ltd., New Delhi, 3rd Edition, 2010.

CS6501 INTERNET PROGRAMMING

UNIT I JAVA PROGRAMMING

WEEK 1 An overview of Java – Data Types – Variables and Arrays – Operators – Control Statements

WEEK 2: Classes – Objects – Methods – Inheritance - Packages – Abstract classes – Interfaces and Inner classes

WEEK 3: Exception handling - Introduction to Threads – Multithreading – String handling – Streams and I/O – Applets.

UNIT II WEBSITES BASICS, HTML 5, CSS 3, WEB

2.0 WEEK 4 : UNIT TEST-I

Web 2.0: Basics-RIA Rich Internet Applications - Collaborations tools - Understanding websites and web servers: Understanding Internet – Difference between websites and web server

WEEK 5: Internet technologies Overview –Understanding the difference between internet and intranet; HTML and CSS: HTML 5.0 , XHTML, CSS 3.

WEEK 6 :- UNIT TEST-II

UNIT III CLIENT SIDE AND SERVER SIDE PROGRAMMING

WEEK 8: Java Script: An introduction to JavaScript–JavaScript DOM Model-Date and Objects,-Regular Expressions- Exception Handling-Validation-Built-in objects-Event Handling- DHTML with JavaScript.

WEEK 9: Servlets: Java Servlet Architecture- Servlet Life Cycle- Form GET and POST actions- Session Handling- Understanding Cookies- Installing and Configuring Apache Tomcat Web Server;

WEEK 10 : DATABASE CONNECTIVITY: JDBC perspectives, JDBC program example - **JSP:** Understanding Java Server Pages-JSP Standard Tag Library(JSTL)-Creating HTML forms by embedding JSP code.

UNIT IV PHP and XML

WEEK 11: UNIT TEST-III

An introduction to PHP: PHP- Using PHP- Variables- Program control- Built-in functions-Connecting to Database – Using Cookies- Regular Expressions; **XML:** Basic XML

WEEK 12: Document Type Definition- XML Schema DOM and Presenting XML, XML Parsers and Validation, XSL and XSLT Transformation, News Feed (RSS and ATOM)

WEEK 13: UNIT TEST-IV

WEEK 14: UNIT V INTRODUCTION TO AJAX and WEB SERVICES

WEEK 15: -AJAX: Ajax Client Server Architecture-XML Http Request Object-Call Back Methods; **Web Services:** Introduction-Java web services Basics

WEEK 16 : Creating, Publishing ,Testing and Describing a Web services (WSDL)-Consuming a web service

WEEK 17: Database Driven web service from an application – SOAP.

WEEK 18:- MODEL EXAM

TEXT BOOKS

1. Deitel and Deitel and Nieto, “Internet and World Wide Web - How to Program”, Prentice Hall, 5th Edition, 2011.
2. Herbert Schildt, “Java-The Complete Reference”, Eighth Edition, Mc Graw Hill Professional,2011.

REFERENCES:

1. Stephen Wynkoop and John Burke “Running a Perfect Website”, QUE, 2nd Edition, 1999.
2. Chris Bates, Web Programming – Building Intranet Applications, 3rd Edition, Wiley Publications, 2009.
3. Jeffrey C and Jackson, “Web Technologies A Computer Science Perspective”, Pearson Education, 2011.
3. Gopalan N.P. and Akilandeswari J., “Web Technology”, Prentice Hall of India, 2011.
4. Paul Dietel and Harvey Deitel, “Java How to Program”, , 8th Edition Prentice Hall of India. Mahesh P. Matha, “Core Java A Comprehensive Study”, Prentice Hall of India, 2011.
5. Uttam K.Roy, “Web Technologies”, Oxford University Press, 2011.

CS6502 OBJECT ORIENTED ANALYSIS AND DESIGN

UNIT I UML DIAGRAMS

WEEK 1:. Introduction to OOAD – Unified Process - UML diagrams – Use Case – Class Diagrams

WEEK 2: Interaction Diagrams – State Diagrams – Activity Diagrams

WEEK 3: Package, component and Deployment Diagrams

UNIT II DESIGN PATTERNS

WEEK4:– UNIT TEST-I

GRASP: Designing objects with responsibilities – Creator – Information expert – Low Coupling

WEEK 5: High Cohesion – Controller - Design Patterns – creational - factory method - structural – Bridge – Adapter -behavioral – Strategy – observer..

WEEK 6: UNIT TEST-II

WEEK 7:

UNIT III CASE

STUDY Internetworks

WEEK 8: – Case study – the Next Gen POS system, Inception -Use case Modeling - Relating Use cases –include, extend and generalization

WEEK 9: Elaboration - Domain Models - Finding conceptual classes and description classes – Associations – Attributes

WEEK 10 : Domain model refinement – Finding conceptual class Hierarchies - Aggregation and Composition

UNIT IV APPLYING DESIGN

PATTERNS WEEK 11: UNIT TEST-III

System sequence diagrams - Relationship between sequence diagrams and use cases Logical architecture and UML package diagram **WEEK**

12: Logical architecture refinement - UML class diagrams – UML interaction diagrams - Applying GoF design patterns.

WEEK 13: UNIT TEST-IV

UNIT V CODING AND TESTING

WEEK 15: Mapping design to code – Testing: Issues in OO Testing

WEEK 16: Class Testing – OO Integration Testing

WEEK 17:- – GUI Testing – OO System Testing

WEEK 18:- MODEL EXAM

TEXT BOOKS

1. Craig Larman, "Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development", Third Edition, Pearson Education, 2005.

REFERENCES

1. Simon Bennett, Steve Mc Robb and Ray Farmer, "Object Oriented Systems Analysis and
2. Design Using UML", Fourth Edition, Mc-Graw Hill Education, 2010.
3. Erich Gamma, a n d Richard Helm, Ralph Johnson, John Vlissides, "Design patterns: Elements of Reusable Object-Oriented Software", Addison-Wesley, 1995.
4. Martin Fowler, "UML Distilled: A Brief Guide to the Standard Object Modeling Language", Third edition, Addison Wesley, 2003.
5. Paul C. Jorgensen, "Software Testing:- A Craftsman's Approach", Third Edition, Auerbach Publications, Taylor and Francis Group, 2008

CS6503 THEORY OF COMPUTATION

UNIT I FINITE AUTOMATA

WEEK 1: Introduction- Basic Mathematical Notation and techniques- Finite State systems – Basic Definitions – Finite Automaton – DFA & NDFA

WEEK 2: Finite Automaton with ϵ - moves – Regular Languages- Regular Expression – Equivalence of NFA and DFA – Equivalence of NDFA's with and without ϵ -moves

WEEK 3: – Equivalence of finite Automaton and regular expressions –Minimization of DFA- - Pumping Lemma for Regular sets – Problems based on Pumping Lemma

UNIT II GRAMMARS

WEEK 4: – UNIT TEST-I

Grammar Introduction– Types of Grammar - Context Free Grammars and Languages– Derivations and Languages – Ambiguity

WEEK 5: – Relationship between derivation and derivation trees – Simplification of CFG – Elimination of Useless symbols - Unit productions.

WEEK 6: Null productions – Greiback Normal form – Chomsky normal form – Problems related to CNF and GNF.

WEEK 7: UNIT TEST-II

UNIT III PUSHDOWN AUTOMATA

WEEK 8:– Pushdown Automata- Definitions – Moves – Instantaneous descriptions – Deterministic pushdown automata

WEEK 9: Equivalence of Pushdown automata and CFL - pumping lemma for CFL

WEEK 10: problems based on pumping Lemma

UNIT IV TURING MACHINES

WEEK 11: UNIT TEST-III

Definitions of Turing machines – Models – Computable languages and functions

WEEK 12: Techniques for Turing machine construction – Multi head and Multi tape Turing Machines.

WEEK 13 : The Halting problem –Partial Solvability – Problems about Turing machine- Chomskian hierarchy of languages

WEEK 14: UNIT TEST-IV

UNIT V UNSOLVABLE PROBLEMS AND COMPUTABLE FUNCTIONS

WEEK 15: Unsolvable Problems and Computable Functions – Primitive recursive functions – Recursive and recursively enumerable languages – Universal Turing machine

WEEK 16 : MEASURING AND CLASSIFYING COMPLEXITY:

Tractable and Intractable problems-

WEEK 17: Tractable and possibly intractable problems – P and NP completeness - Polynomial time reductions.

WEEK 18:- MODEL EXAM

TEXT BOOK

1. Hopcroft J.E., Motwani R. and Ullman J.D, “Introduction to Automata Theory, Languages and Computations”, Second Edition, Pearson Education, 2008. (UNIT 1,2,3)
2. John C Martin, “Introduction to Languages and the Theory of Computation”, Third Edition, Tata McGraw Hill Publishing Company, New Delhi, 2007. (UNIT 4,5)

REFERENCES

1. Mishra K L P and Chandrasekaran N, “Theory of Computer Science - Automata, Languages and Computation”, Third Edition, Prentice Hall of India, 2004.
2. Harry R Lewis and Christos H Papadimitriou, “Elements of the Theory of Computation”, Second Edition, Prentice Hall of India, Pearson Education, New Delhi, 2003.
3. Peter Linz, “An Introduction to Formal Language and Automata”, Third Edition, Narosa Publishers, New Delhi, 2002.
4. Kamala Krithivasan and Rama. R, “Introduction to Formal Languages, Automata Theory and Computation”, Pearson Education 2009

CS6504 COMPUTER GRAPHICS

UNIT I INTRODUCTION

WEEK 1: Survey of computer graphics, Overview of graphics systems – Video display devices, Raster scan systems, Random scan systems, Graphics monitors and Workstations, Input devices, Hard copy Devices, Graphics Software

WEEK 2: – Output primitives – points and lines, line drawing algorithms, loading the frame buffer, line function;

WEEK 3: circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives.

UNIT II TWO DIMENSIONAL

GRAPHICS WEEK 4: UNIT TEST-I

Two dimensional geometric transformations – Matrix representations and homogeneous coordinates, composite transformations;

WEEK 5Two dimensional viewing – viewing pipeline, viewing coordinate reference frame; widow-to-viewport coordinate transformation

WEEK 6: Two dimensional viewing functions; clipping operations – point, line, and polygon clipping algorithms.

WEEK 7: UNIT TEST-II

UNIT III THREE DIMENSIONAL GRAPHICS

Three dimensional concepts; Three dimensional object representations – Polygon surfaces- Polygon tables- Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations

WEEK 8: Bezier curves and surfaces -B-Spline curves and surfaces.

TRANSFORMATION AND VIEWING: Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations

WEEK 9: Three dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods

WEEK 10: UNIT TEST-III

UNIT IV ILLUMINATION AND COLOUR MODELS

Light sources - basic illumination models – halftone patterns and dithering techniques;

WEEK 11: – Properties of light - Standard primaries and chromaticity diagram; Intuitive colour concepts - RGB colour model

WEEK 12: YIQ colour model - CMY colour model - HSV colour model - HLS colour model; Colour selection

WEEK 13 : UNIT TEST-IV

WEEK 14:

UNIT V ANIMATIONS & REALISM

WEEK15: ANIMATION GRAPHICS: Design of Animation sequences – animation function – raster animation –

WEEK 16: key frame systems – motion specification –morphing – tweening. COMPUTER GRAPHICS REALISM:

WEEK 17: Tiling the plane – Recursively defined curves – Koch curves – C curves – Dragons –space filling curves – fractals – Grammar based models – fractals – turtle graphics – ray tracing

WEEK 18:- MODEL EXAM

TEXT BOOK

1. John F. Hughes, Andries Van Dam, Morgan Mc Guire ,David F. Sklar , James D. Foley, Steven K. Feiner and Kurt Akeley ,”Computer Graphics: Principles and Practice” , , 3rd Edition, Addison- Wesley Professional,2013. (UNIT I, II, III, IV).
2. Donald Hearn and Pauline Baker M, “Computer Graphics”, Prentice Hall, New Delhi, 2007 (UNIT V).

REFERENCES

1. Donald Hearn and M. Pauline Baker, Warren Carithers,“Computer Graphics With Open GL”, 4th Edition, Pearson Education, 2010.
2. Jeffrey McConnell, “Computer Graphics: Theory into Practice”, Jones and Bartlett Publishers, 2006.
3. Hill F S Jr., "Computer Graphics", Maxwell Macmillan” , 1990.
4. Peter Shirley, Michael Ashikhmin, Michael Gleicher, Stephen R Marschner, Erik Reinhard, Kelvin Sung, and AK Peters, Fundamental of Computer Graphics, CRC Press, 2010.
5. William M. Newman and Robert F.Sproull, “Principles of Interactive Computer Graphics”, Mc Graw Hill 1978.
6. <http://nptel.ac.in/>

CS6511 CASE TOOLS LABORATORY

LIST OF EXPERIMENTS

To develop a mini-project by following the 9 exercises listed below.

1. To develop a problem statement.
2. Identify Use Cases and develop the Use Case model.
3. Identify the conceptual classes and develop a domain model with UML Class diagram.
4. Using the identified scenarios, find the interaction between objects and represent them using
5. UML Sequence diagrams.
6. Draw relevant state charts and activity diagrams.
7. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered,
8. logical architecture diagram with UML package diagram notation.
9. Develop and test the Technical services layer.
10. Develop and test the Domain objects layer.
11. Develop and test the User interface layer.

SUGGESTED DOMAINS FOR MINI-PROJECT:

1. Passport automation system.
2. Book bank
3. Exam Registration
4. Stock maintenance system.
5. Online course reservation system
6. E-ticketing
7. Software personnel management system
8. Credit card processing
9. e-book management system
10. Recruitment system
11. Foreign trading system
12. Conference Management System
13. BPO Management System
14. Library Management System
15. Student Information System

CS6512 INTERNET PROGRAMMING LABORATORY

LIST OF EXPERIMENTS

WEBPAGE CONCEPTS

- a) Create a web page with the following using HTML
 - a. To embed a map in a web page
 - b. To fix the hot spots in that map
 - c. Show all the related information when the hot spots are clicked.
- b) Create a web page with the following.
 - a. Cascading style sheets.
 - b. Embedded style sheets.
 - c. Inline style sheets. Use our college information for the web pages.
- c) Create and save an XML document at the server, which contains 10 users Information. Write a Program, which takes user Id as an input and returns the User details by taking the user information from the XML document.

SOCKETS & SERVLETS

- a) Write programs in Java using sockets to implement the following:
 - I. HTTP request
 - II. FTP
 - III. SMTP
 - IV. POP3
- b) Write a program in Java for creating simple chat application with datagram sockets and datagram packets.
- c) Write programs in Java using Servlets:
 - i. To invoke servlets from HTML forms
 - ii. To invoke servlets from Applets
- d) 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.
- e) Write a program to lock servlet itself to a particular server IP address and port number. It requires an init parameter key that is

appropriate for its servlet IP address and port before it unlocks itself and handles a request

f) Session tracking using hidden form fields and Session tracking for a hit count

g) Install TOMCAT web server. Convert the static webpages of programs 1&2 into dynamic web pages using servlets (or JSP) and cookies. Hint: Users information (user id, password, credit card number) would be stored in web.xml. Each user should have a separate Shopping Cart.

ADVANCE CONCEPTS:

a) Implement a simple program using following frameworks

a. JSP Struts Framework b. Hibernate c. Spring

b) Explore the following application in AJAX: Searching in real time with live searches, Getting the answer with auto complete, Chatting with friends ,Dragging and dropping with Ajax,

Getting instant login feedback, Ajax-enabled popup menus, and Modifying Web pages on the fly

c) Write a web services for finding what people think by asking 500 people's opinion for any consumer product

d) Write a web services for predicting for any product sales

CS6513 COMPUTER GRAPHICS LABORATORY
IMPLEMENT THE EXERCISES USING C / OPENGL / JAVA

1. Implementation of Algorithms for drawing 2D Primitives –
Line (DDA, Bresenham) – all slopes
Circle (Midpoint)
2. 2D Geometric transformations
– Translation
Rotation
Scaling
Reflection
Shear
Window-Viewport
3. Composite 2D Transformations
4. Line Clipping
5. 3D Transformations - Translation, Rotation, Scaling.
6. 3D Projections – Parallel, Perspective.
7. Creating 3D Scenes.
8. Image Editing and Manipulation - Basic Operations on image using any image editing software, Creating gif animated images, Image optimization.
9. 2D Animation – To create Interactive animation using any authoring tool
