

VELTECH MULTI 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 INFORMATION TECHNOLOGY

IV YEAR DEGREE COURSE

#42, Avadi – Vel Tech Road,
Avadi

Chennai – 600062

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Institution vision and mission

The vision

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

The 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 of Information Technology

Vision

- To emerge as centre for academic eminence in the field of information technology through innovative learning practices.

Mission

- **M1** - To provide good teaching and learning environment for quality education in the field of information technology.
- **M2** - To propagate lifelong learning.
- **M3** - 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.

PROGRAM EDUCATIVE OBJECTIVES

1. The graduates of Information Technology Engineering Program should be able to Excel in professional carrier and or higher education by acquiring knowledge in mathematical, computing and engineering principles.
2. The Graduates of Information Technology Engineering Program should have an exposure to emerging cutting edge technologies, adequate training and opportunities to work as teams on multidisciplinary projects with effective communication skills.
3. The Graduates of Information Technology Engineering Program should be able to establish an understanding of professionalism, ethics, public policy and aesthetics that allows them to become good professional Engineers
4. The graduates should be able to advance professionally through organized training or self-learning in areas related to computer science and information technology.
5. The graduates of Information Technology Engineering Program should be able to develop an ability to analyze the requirements, understand the technical specifications, design and provide novel engineering solutions and produce efficient product designs.

Programme Outcomes (POs)

Graduates of the 4-year B.Tech. Information Technology (IT) Programme will:

1. Apply knowledge of **mathematics, natural science, engineering** fundamentals, software development, Database management, computer networking, data communication, and information security to the solution of complex engineering problems in Information Technology.
2. Ability to **identify, formulate** and **analyze complex** technical problems in the recent cutting edge areas of hardware and software applications to reach significant conclusions by applying Mathematics, Natural sciences.
3. Ability to analysis, **design**, test and documentation of computer programs, maintenance of networks, databases, security and computer systems (both hardware and software) and providing optimum **design solutions** to meet specified needs of the recent trends.
4. 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.
5. Ability to create, select and apply **state of the art tools** and techniques in designing, developing and testing a computing system with the help of latest application software, operating systems, simulation and databases tools.
 6. Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to **professional engineering practice** in system development and solutions to **complex engineering problems** related to Information technologies
 7. Understand and evaluate the sustainability and **impact of professional engineering** work in the solution of complex engineering problems related to societal and environmental contexts with full responsibilities.
 8. An understanding of **professional** and **ethical responsibility** and commitment to them.
 9. Ability to function effectively to strive towards **achieving a common goal** as an individual in a group and with the capacity to be a team leader.
 10. **Communicate effectively** on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
 11. Ability to function on **multi-disciplinary** teams, apply engineering and **management knowledge** and techniques to estimate time and resources needed to complete a computer **engineering projects**
 12. Recognize the need for, and have the preparation and ability to **engage in independent** and **lifelong learning** in the broadest context of technological change.

WEEK DETAILS

SL.NO.	WEEK	FROM	TO
1	WEEK1	24.06.2017	-
2	WEEK2	27.06.2017	01.07.2017
3	WEEK3	03.07.2017	08.07.2017
4	WEEK4	10.07.2017	15.07.2017
5	WEEK5	17.07.2017	22.07.2017
6	WEEK6	24.07.2017	29.07.2017
7	WEEK7	31.07.2017	05.08.2017
8	WEEK8	07.08.2017	12.08.2017
9	WEEK9	16.08.2017	19.08.2017
10	WEEK10	21.08.2017	26.08.2017
11	WEEK11	28.08.2017	1.09.2017
12	WEEK12	4.09.2017	9.09.2017
13	WEEK13	11.09.2017	16.09.2017
14	WEEK14	18.09.2017	23.09.2017
15	WEEK15	25.09.2017	28.09.2017
16	WEEK16	3.10.2017	7.10.2017
17	WEEK17	09.10.2017	14.10.2017

SUBJECT CONTENTS

SL.NO	SUBJECT CODE	SUBJECT NAME
THEORY		
1	CS6551	Computer Networks
2	IT6501	Graphics and Multimedia
3	CS6502	Object Oriented Analysis and Design
4	IT6502	Digital Signal Processing
5	IT6503	Web Programming
6	EC6801	Wireless Communication
PRACTICAL		
7	IT6511	Networks Laboratory
8	IT6512	Web Programming Laboratory
9	IT6513	Case Tools Laboratory

TEST / EXAM SCHEDULE

SL. NO	SUBJECT CODE	SUBJECT NAME	UNIT TEST I	UNIT TEST II	Pre Model Exam	UNIT TEST IV	MODEL EXAM
1	CS6551	Computer Networks	10.07.2017 FN	27.07.2017 FN	06.08.2017 FN	7.09.17 FN	28.09.2017 FN
2	IT6501	Graphics and Multimedia	10.07.2017 AN	27.07.2017 AN	07.08.2017 AN	7.09.17 AN	04.10.2017 FN
3	CS6502	Object Oriented Analysis and Design	11.07.2017 FN	28.07.2017 FN	08.09.2017 FN	8.09.17 FN	06.10.2017 FN
4	IT6502	Digital Signal Processing	11.07.2017 AN	28.07.2017 AN	09.08.2017 AN	8.09.17 AN	9.10.2017 FN
5	IT6503	Web Programming	12.07.2017 FN	29.07.2017 FN	10.08.2017 FN	9.09.17 FN	11.10.2017 FN
6	EC6801	Wireless Communication	12.07.2017 AN	29.07.2017 AN	12.08.2017 AN	9.09.17 AN	13.10.2017 FN

CS6551 COMPUTER NETWORKS

WEEK 1: UNIT I FUNDAMENTALS & LINK LAYER

Building a network – Requirements - Layering and protocols

WEEK 2:

Internet Architecture – Network software – Performance

WEEK 3

Link layer Services - Framing - Error Detection - Flow control

WEEK 4: UNIT TEST-I

UNIT II MEDIA ACCESS & INTERNETWORKING

Media access control - Ethernet (802.3) Wireless LANs – 802.11 – Bluetooth

WEEK 5: Switching and bridging – Basic Internetworking (IP, CIDR, ARP, DHCP, ICMP)

WEEK 6: UNIT TEST-II

WEEK 7: UNIT III ROUTING

Routing (RIP, OSPF, metrics) – Switch basics

WEEK 8:

Global Internet (Areas, BGP, IPv6), Multicast – addresses – multicast routing (DVMRP, PIM)

WEEK 9: PRE MODEL

WEEK 10: UNIT TEST-III

UNIT IV TRANSPORT LAYER

Overview of Transport layer - UDP - Reliable byte stream (TCP)

WEEK 11:

Connection management - Flow control - Retransmission – TCP Congestion control

WEEK 12:

Congestion avoidance (DECbit, RED) – QoS – Application requirements

WEEK 13: UNIT TEST-IV

WEEK 14: UNIT V

Application Layer

WEEK 15:

Traditional applications -Electronic Mail (SMTP, POP3, IMAP, MIME) HTTP – Web Services – DNS - SNMP

WEEK 16: MODEL EXAM

WEEK 17: MODEL EXAM

TEXT BOOK:

1. Larry L. Peterson, Bruce S. Davie, “Computer Networks: A systems approach”, Fifth Edition, Morgan Kaufmann Publishers, 2011.

REFERENCES:

1. James F. Kurose, Keith W. Ross, “Computer Networking - A Top-Down Approach Featuring the Internet”, Fifth Edition, Pearson Education, 2009.
2. Nader. F. Mir, “Computer and Communication Networks”, Pearson Prentice Hall Publishers, 2010.
3. Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, “Computer Networks: An Open Source Approach”, Mc Graw Hill Publisher, 2011.
4. Behrouz A. Forouzan, “Data communication and Networking”, Fourth Edition, Tata McGraw – Hill, 2011.

IT6501 GRAPHICS AND MULTIMEDIA

WEEK 1: UNIT I OUTPUT PRIMITIVES

Basic – Line

WEEK 2:

Two- Dimensional geometric transformations - Curve and ellipse drawing algorithms – Examples – Applications - Attributes

WEEK 3:

Two-Dimensional clipping and viewing – Input techniques

WEEK 4: UNIT TEST-I

UNIT II THREE-DIMENSIONAL CONCEPTS

Three-Dimensional object representations – Three-Dimensional geometric and modeling transformations

WEEK 5:

Three-Dimensional viewing – Hidden surface elimination – Color models – Virtual reality - Animation

WEEK 6: UNIT TEST-II

WEEK 7: UNIT III MULTIMEDIA SYSTEMS DESIGN

Multimedia basics – Multimedia applications – Multimedia system architecture –

WEEK 8:

Evolving technologies for multimedia Defining objects for multimedia systems, Multimedia data interface standards – Multimedia databases

WEEK 9: PRE MODEL

WEEK 10: UNIT TEST-III

UNIT IV MULTIMEDIA FILE HANDLING

Compression and decompression – Data and file format standards – Multimedia I/O technologies

WEEK 11:

Digital voice and audio – Video image and animation

WEEK 12:

Full motion video – Storage and retrieval technologies

WEEK 13: UNIT TEST-IV

WEEK 14: UNIT V

Multimedia authoring and user interface – Hypermedia messaging- Mobile messaging – Hypermedia message component

WEEK 15: HYPERMEDIA

Creating hypermedia message - Integrated multimedia message standards – Integrated document management – Distributed multimedia systems

WEEK 16: MODEL EXAM

WEEK 17: MODEL EXAM

TEXT BOOKS:

1. Donald Hearn and M. Pauline Baker, “Computer Graphics C Version”, Pearson Education, 2003.
2. Andleigh, P. K and Kiran Thakrar, “Multimedia Systems and Design”, PHI, 2003.

REFERENCES:

1. Judith Jeffcoate, “Multimedia in practice: Technology and Applications”, PHI, 1998.
2. Foley, Vandam, Feiner and Huges, “Computer Graphics: Principles and Practice”, 2nd Edition, Pearson Education, 2003.

CS6502 OBJECT ORIENTED ANALYSIS AND DESIGN

WEEK 1: UNIT I UML DIAGRAMS

Introduction to OOAD –

WEEK 2:

State Diagrams Activity Diagrams – Package, component and Deployment Diagrams - Unified Process - UML diagrams Use Case – Class Diagrams– Interaction Diagrams

WEEK 3: UNIT II DESIGN PATTERNS

GRASP: Designing objects with responsibilities – Creator – Information expert

WEEK 4: UNIT TEST-I

Low Coupling – High Cohesion – Controller - Design Patterns – creational

WEEK 5:

Factory method - structural – Bridge – Adapter -behavioral – Strategy – observer

WEEK 6: UNIT TEST-II

WEEK 7: UNIT III CASE STUDY

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

WEEK 8:

Elaboration - Domain Models - Finding conceptual classes and description classes – Associations – Attributes - Domain model refinement – Finding conceptual class Hierarchies - Aggregation and Composition

WEEK 9: PRE MODEL

WEEK 10: UNIT TEST-III

UNIT IV APPLYING DESIGN PATTERNS

System sequence diagrams - Relationship between sequence diagrams and use cases

WEEK 11:

Logical architecture and UML package diagram – Logical architecture refinement

WEEK 12:

UML class diagrams - UML interaction diagrams - Applying GoF design patterns

WEEK 13: UNIT TEST-IV

WEEK 14: OO Integration Testing – GUI Testing – OO System Testing

WEEK 15: UNIT V CODING AND TESTING

Mapping design to code – Testing: Issues in OO Testing - Class Testing –

WEEK 16: MODEL EXAM

WEEK 17: MODEL EXAM

TEXT BOOK:

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 Design Using UML", Fourth Edition, Mc-Graw Hill Education, 2010.
2. Erich Gamma, and Richard Helm, Ralph Johnson, John Vlissides, "Design patterns: Elements of Reusable Object-Oriented Software", Addison-Wesley, 1995.
3. Martin Fowler, "UML Distilled: A Brief Guide to the Standard Object Modeling Language", Third edition, Addison Wesley, 2003.

4. Paul C. Jorgensen, “Software Testing:- A Craftsman’s Approach”, Third Edition, Auerbach Publications, Taylor and Francis Group, 2008.

IT6502 DIGITAL SIGNAL PROCESSING

WEEK 1: UNIT I SIGNALS AND SYSTEMS

Basic elements of DSP

WEEK 2:

Sampling theorem – Discrete – time signals, systems – Analysis of discrete time LTI systems - – concepts of frequency in Analog and Digital Signals

WEEK 3:

Z transforms – Convolution – Correlation

WEEK 4: UNIT TEST-I

UNIT II FREQUENCY TRANSFORMATIONS

Introduction to DFT – Properties of DFT – Circular Convolution - Filtering methods based on DFT – FFT Algorithms - Decimation – in – time Algorithms,

WEEK 5:

Decimation – in – frequency Algorithms – Use of FFT in Linear Filtering – DCT – Use and Application of DCT.

WEEK 6: UNIT TEST-II

Approximation of derivatives – (LPF, HPF, BPF, BRF) filter design using frequency translation

WEEK 7: UNIT III IIR FILTER DESIGN

Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter -

WEEK 8:

IIR filter design by Impulse Invariance, Bilinear transformation

WEEK 9: PRE MODEL

WEEK 10: UNIT TEST-III

UNIT IV FIR FILTER DESIGN

Structures of FIR – Linear phase FIR filter

WEEK 11:

Fourier Series - Filter design using windowing techniques

WEEK 12:

(Rectangular Window, Hamming Window, Hanning Window),

WEEK 13: UNIT TEST-IV**WEEK 14: UNIT V**

Frequency sampling techniques

WEEK 15:

Finite Word Length Effects In Digital Filters - Binary fixed point and floating point number representations – Comparison - Quantization noise – truncation and rounding - Quantization noise power- input quantization error- coefficient quantization error – limit cycle oscillations-dead band- Overflow error-signal scaling

WEEK 16: MODEL EXAM**WEEK 17: MODEL EXAM****TEXT BOOK:**

1. John G. Proakis and Dimitris G.Manolakis, “Digital Signal Processing – Principles, Algorithms & Applications”, Fourth Edition, Pearson Education, Prentice Hall, 2007.

REFERENCES:

1. Emmanuel C.Ifeachor, and Barrie.W.Jervis, “Digital Signal Processing”, Second Edition, Pearson Education, Prentice Hall, 2002.
2. Sanjit K. Mitra, “Digital Signal Processing – A Computer Based Approach”, Third Edition, Tata Mc Graw Hill, 2007.
3. A.V.Oppenheim, R.W. Schafer and J.R. Buck, Discrete-Time Signal Processing, 8th Indian Reprint, Pearson, 2004.
4. Andreas Antoniou, “Digital Signal Processing”, Tata McGraw Hill, 2006

IT6503 WEB PROGRAMMING

WEEK 1: UNIT I SCRIPTING

Web page Designing using HTML

WEEK 2:

Statements and features- events - windows - documents - frames - data types - built-in functions- Browser object model-, Scripting basics- Client side and server side scripting Java Script Object, names, literals, operators and expressions

WEEK 3:

Verifying forms-HTML5- CSS3- HTML 5 canvas - Web site creation using tools

WEEK 4: UNIT TEST-I

UNIT II JAVA

Introduction to object oriented programming-Features of Java – Data types, variables and arrays – Operators – Control statements

WEEK 5:

Classes and Methods – Inheritance Packages and Interfaces – Exception Handling – Multithreaded Programming – Input/ Output – Files – Utility Classes – String Handling

WEEK 6: UNIT TEST-II

WEEK 7: UNIT III JDBC

JDBC Overview – JDBC implementation – Connection class – Statements - Catching Database - Inet Address class – URL class- TCP sockets - UDP sockets, Java Beans –RMI

WEEK 8:

Results, handling database Queries. Networking

WEEK 9: PRE MODEL

WEEK 10: UNIT TEST-III

UNIT IV APPLETS

Java applets- Life cycle of an Applet – Adding images to an Applet – Adding sound to an applet

WEEK 11:

Passing parameters to an Applet. Event Handling. Introducing AWT: Working with Windows Graphics and Text.

WEEK 12:

Using AWT Controls, Layout Managers and Menus. Servlet – life cycle of a servlet. The Servlet API, Handling HTTP Request and Response, using Cookies, Session Tracking. Introduction to JSP.

WEEK 13: UNIT TEST-IV**WEEK 14: REVISION UNIT I-V****WEEK 15: UNIT V XML AND WEB SERVICES**

Xml – Introduction-Form Navigation-XML Documents- XSL. XSLT- Web services-UDDI-WSDL-Java web services – Web resources

WEEK 16: MODEL EXAM**WEEK 17: MODEL EXAM****TEXT BOOKS:**

1. Harvey Deitel, Abbey Deitel, Internet and World Wide Web: How To Program 5th Edition.
2. Herbert Schildt, Java - The Complete Reference, 7th Edition. Tata McGraw- Hill Edition.
3. Michael Morrison XML Unleashed Tech media SAMS.

REFERENCES:

1. John Pollock, Javascript - A Beginners Guide, 3rd Edition -- Tata McGraw-Hill Edition.
2. Keyur Shah, Gateway to Java Programmer Sun Certification, Tata McGraw Hill, 2002.

EC6801 WIRELESS COMMUNICATION

WEEK 1: UNIT I WIRELESS CHANNELS

Large scale path loss – Path loss models

WEEK 2:

Free Space and Two-Ray models -Link Budget design – Small scale fading-Parameters of mobile multipath channels – Time dispersion parameters-Coherence bandwidth – Doppler spread

WEEK 3:

Coherence time, Fading due to Multipath time delay spread – flat fading – frequency selective fading – Fading due to Doppler spread – fast fading – slow fading

WEEK 4: UNIT TEST-I

UNIT II CELLULAR ARCHITECTURE

Multiple Access techniques - FDMA, TDMA, CDMA – Capacity calculations–Cellular concept- Frequency reuse

WEEK 5:

Channel assignment- hand off- interference & system capacity-trunking & grade of service – Coverage and capacity improvement

WEEK 6: UNIT TEST-II

WEEK 7: UNIT III DIGITAL SIGNALING FOR FADING CHANNELS

Structure of a wireless communication link, Principles of Offset-QPSK, p/4-DQPSK, Minimum Shift

WEEK 8:
Keying, Gaussian Minimum Shift Keying, Error performance in fading channels- OFDM principle – Cyclic prefix, Windowing, PAPR

WEEK 9: PRE MODEL

WEEK10: UNIT IV

MULTIPATH MITIGATION TECHNIQUES

Equalization – Adaptive equalization, Linear and Non-Linear equalization, Zero forcing and LMS

WEEK 11:

Algorithms. Diversity – Micro and Macrodiversity, Diversity combining techniques.

WEEK 12:

Error probability in fading channels with diversity reception, Rake receiver

WEEK 13: UNIT TEST-IV**WEEK 14: REVISION (UNIT -I-IV)****WEEK 15: UNIT V MULTIPLE ANTENNA TECHNIQUES**

MIMO systems – spatial multiplexing -System model -Pre-coding - Beam forming - transmitter diversity, receiver diversity - Channel state information-capacity in fading and non-fading channels

WEEK 16: MODEL EXAM**WEEK 17: MODEL EXAM****TEXT BOOKS:**

1. Rappaport,T.S., “Wireless communications”, Second Edition, Pearson Education, 2010.
2. Andreas.F. Molisch, “Wireless Communications”, John Wiley – India, 2006.

REFERENCES:

1. David Tse and Pramod Viswanath, “Fundamentals of Wireless Communication”, Cambridge University Press, 2005.
2. Upena Dalal, “ Wireless Communication”, Oxford University Press, 2009.
3. Van Nee, R. and Ramji Prasad, “OFDM for wireless multimedia communications”, Artech House, 2000.

IT6511 NETWORKS LABORATORY

LIST OF EXPERIMENTS:

1. Implementation of Stop and Wait Protocol and Sliding Window Protocol.
2. Study of Socket Programming and Client – Server model
3. Write a code simulating ARP /RARP protocols.
4. Write a code simulating PING and TRACEROUTE commands
5. Create a socket for HTTP for web page upload and download.
6. Write a program to implement RPC (Remote Procedure Call)
7. Implementation of Subnetting .
8. Applications using TCP Sockets like
 - a. Echo client and echo server
 - b. Chat
 - c. File Transfer
9. Applications using TCP and UDP Sockets like
 - d. DNS
 - e. SNMP
 - f. File Transfer
10. Study of Network simulator (NS).and Simulation of Congestion Control Algorithms using NS
11. Perform a case study about the different routing algorithms to select the network path with its optimum and economical during data transfer.
 - i. Link State routing
 - ii. Flooding
 - iii. Distance vector

IT6512 WEB PROGRAMMING LABORATORY

LIST OF EXPERIMENTS:

1. Write a html program for Creation of web site with forms, frames, links, tables etc
2. Design a web site using HTML and DHTML. Use Basic text Formatting, Images,
3. Create a script that asks the user for a name, and then greets the user with "Hello" and the user name on the page
4. Create a script that collects numbers from a page and then adds them up and prints them to a blank field on the page.
5. Create a script that prompts the user for a number and then counts from 1 to that number displaying only the odd numbers.
6. Create a script that will check the field in Assignment 1 for data and alert the user if it is blank. This script should run from a button.
7. Using CSS for creating web sites
8. Creating simple application to access data base using JDBC Formatting HTML with CSS.
9. Program for manipulating Databases and SQL.
10. Program using PHP database functions.
11. Write a web application that functions as a simple hand calculator, but also keeps a "paper trail" of all your previous work
12. Install Tomcat and use JSP and link it with any of the assignments above
13. Reading and Writing the files using .Net
14. Write a program to implement web service for calculator application
15. Implement RMI concept for building any remote method of your choice

IT6513 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 UML Sequence diagrams.
5. Draw relevant state charts and activity diagrams.
6. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
7. Develop and test the Technical services layer.
8. Develop and test the Domain objects layer.
9. 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
