

## 5.1 JAVA PROGRAMMING

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### RATIONALE

Today, the most likely place you will find Java is on World Wide Web. The web acts as convenient transport mechanism for Java programs and the web's ubiquity has popularized Java as an Internet development tool. Java has shifted the programming paradigm of single machine to distributed network of machines. Any application on World Wide Web can be easily implemented. Internet can have numerous applications and various protocols. This course will enable the students to learn in detail network programming language Java.

### DETAILED CONTENTS

1. Introduction to Java (6 hrs)  
A brief history, how Java works. Java Virtual Machine (JVM), Java in time compiler (JIT), Java features, using Java with other tools, native code, Java application types, comparison with C and C++
2. Working with data types, control flow statements, arrays, casting, command line arguments (6 hrs)
3. Java Classes and Memory Management (6 hrs)  
Introduction to Classes, inheritance, encapsulation and polymorphism, constructors and finalizers, garbage collection, access specifier
4. Interfaces and Packages (6 hrs)  
Using Java interface, using Java packages
5. Exception Handling and Stream Files (8 hrs)  
Over view of exception handling, method to use exception handling, method available to exceptions (The throw statement, the throws class, finally class), creating your own exception classes
6. Threads and Multi-threading (6 hrs)  
Overview, thread basics - creating and running a thread, The thread control methods, The threads life cycle and synchronization
7. Introduction to Applet, Application and JDK (6 hrs)  
Java applets Vs Java applications, building application with JDK, building applets with JDK, HTML for Java applets, managing input-output stream
8. Java Data Base Connectivity (JDBC) (4 hrs)

## LIST OF PRACTICALS

1.
  - a) Write a program which tells whether a number is even or odd. Take a range from 1 – 50
  - b) Display the output which is given below:
 

```

          *
          * *
          * * *
          
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  - c) Write a program which sorts an array of type integer
  - d) Write a programme to determine the sum of the following harmonic series for a given value of n:  $1 + 1/2 + 1/3 + \dots + 1/n$  the value of n should be given interactively through the keyboard
2. Write a programme to convert the given temperature in Fahrenheit to Celsius using the following conversion formula  
 $C = F - 32 / 1.8$  and display the value in a tabular form
3. Write a programme to find all the numbers and sum of all integers greater than 100 less than 200 that are divisible by 7
4. Given a list of marks ranging from 0 to 100, write a programme to compute and print the number of student should have obtained marks (a) in the range 81 to 100 (ii) in the range 61 to 80 (c) in the range 41 to 60 (d) in the range 0 to 40. The programme should use a minimum number of if statement
5. Admission to a professional course is subject to the following conditions:
  - Marks in mathematics  $\geq 60$
  - Marks in physics  $\geq 50$
  - Marks in chemistry  $\geq 40$
  - Total in all 3 subjects  $\geq 200$  (OR)
 Total in mathematics and physics  $\geq 150$  given the marks in the 3 subjects. Write the programme to process the application to list the eligible candidates
6. The number in the sequence 1 1 2 3 5 8 13 21 ..... are called Fibonacci numbers. Write programme using a do ..... while loop to calculate and print the first m fibonacci numbers (Hint: after the first 2 numbers in the series, each number is the sum of the 2 preceding the numbers)
7. Write a programme to evaluate the following investment equation  $V = P(1+r)^n$  and print the tables which would give the value of V for various combination of the following values of P, r and n.

8. Write a program which will store the students roll no. names and total marks in the database
9. Write a program which will display all those records whose marks are above 75%
10. Write a programme to draw the following using Applet:



## INSTRUCTIONAL STRATEGY

The subject deals with object oriented concept. As the subject has both theory and practicals, more stress should be given to practical work.

## RECOMMENDED BOOKS

1. Mastering Java by John Zukowski; BPB Publication, New Delhi
2. The Complete Reference by Patrick Naughton, Tata McGraw Hill Education Pvt Ltd , New Delhi
3. Java Programming by Balagurusamy, Tata McGraw Hill Education Pvt Ltd , New Delhi
4. Java 6 in simple steps, kogent learning solutions Inc., Dreamtech Press, Daryaganj, New Delhi
5. The Complete Reference Java by Herbel Schildt; McGraw Hill, New Delhi
6. Java 2 Programming Bible by Aaron Walsh, Justin Couch, Daniel Steinberg, IDG Books India Pvt. Ltd., Netaji Subhash Marg, Darya Ganj, New Delhi
7. Java Pogramming- "How to Program Java" by Dietal and Dietel
8. An Introduction to Java Programming by Y Daniel Liang; Prentice Hall of India
9. Core Java by Cay S Horseman and Lray Carnell.
10. Introduction to Cryptography with applets by David Bishop, Narosa Publishing House Pvt Ltd, Darya Ganj, New Delhi 110002

## SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPER SETTER

Sr. No.	Topic	Time Allotted (Hrs)	Marks Allotted (%)
1	Introduction to Java	6	10
2	Working with Data types	6	10
3	Java Classes and Memory Management	6	10
4	Interfaces and Packages	6	10
5	Exception Handling and Stream Files	8	30
6	Threads and Multi-threading	6	10
7	Introduction to Applet, Application and JDK	6	10
8	Java Data Base Connectivity (JDBC)	4	10
<b>Total</b>		<b>48</b>	<b>100</b>

## 5.2 WIRELESS COMMUNICATION

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### RATIONALE

Wireless Communication course is intended to provide exposure and awareness of latest wireless communication technologies. This course is designed in conjunction with course “Computer Networks” which provide concepts of networks.

### DETAILED CONTENTS

1. Introduction (12 hrs)  
  
Evolution of Mobile Communication Systems, Paging systems, cordless telephone system, cellular telephone system, comparison of common wireless communication system, 2G cellular networks, 2.5G wireless network, HSCSD, GPRS, EDGE technology, 3G wireless network, UMTS, 3G CDMA2000, 3G TD-SCDMA, wireless local loop, blue tooth and personal area networks.
2. System Design Fundamentals (9 hrs)  
  
Frequency reuse, channel alignment strategies, handoff strategies, interference and system capacity, improving coverage and capacity in cellular systems, parameters for mobile multipath channel, small scale fading,
3. Modulation Techniques (10 hrs)  
  
Amplitude modulation, angle modulation, digital modulation, linear modulation techniques, constant envelope modulation, spread spectrum modulation techniques, equalization, equalizers in communication receiver, diversity techniques, RAKE receiver, fundamentals of channel coding.
4. Multiple Access Techniques (4 hrs)  
  
FDMA, TDMA, CDMA, SDMA
5. Wireless Networking (5 hrs)  
  
Different between wireless and fixed telephone networks, development of wireless networks, ISDN
6. Wireless Systems (8 hrs)  
  
GMS, GSM architecture, CDMA digital cellular standard, IS-95 system, IEEE 802.11b, 802.11G, blue tooth and RF

## LIST OF PRACTICALS

1. Study the features, specification and working of cellular mobile
2. Signal strength measurement of various points from a transmitting antenna/cordless phone
3. Measurement of range for a cordless phone
4. Visit of a Mobile Switching Centre(MSC) in the nearest M.S. facility provider
5. Demonstration of Base Trans Receiver(BTS) with nearby cellular tower
6. Observing call processing of GSM trainer Kit.
7. Observing call processing of CDMA trainer Kit.
8. Practice of setting GPRS on Mobile phone
9. Repair of a (GSM) and a (CDMA) mobile phones
10. Measurement of cell boundary (time consuming project)
11. Data transfer using blue tooth

Demonstration  
only

## INSTRUCTIONAL STRATEGY

Explanation of concepts using realtime examples/case studies. . For the proper awareness of this subject it is must to provide the students the detail functioning of wireless/mobile system/equipment. Ffor this visits must be arranged to BTS/MSC (Mobile Switching Centre) providers. The theory classes need to be application based in addition to industrial visits in the BSNL, Vodafone, Airtel, SPICE , TATA indicom etc

## RECOMMENDED BOOKS

1. Wireless Communications, Principles and Practice, by Theodore S.Rappaport.
2. Wireless Communications by Singal, Tata McGraw Hill Education Pvt Ltd , New Delhi
3. Wireless Communications by Misra, Tata McGraw Hill Education Pvt Ltd , New Delhi
4. Introduction to Wireless and Mobile Systems, by Dharma Prakash Agarwal, Qing-An zeng.
5. Wireless Communications and Networking, by William Stallings.
6. Mobile and Personal Communication Systems and Services, by Raj Pandya, Prentice Hall of India, New Delhi
7. Mobile Communication by John Schiller, Prentice Hall of India, New Delhi
8. Wireless Communications by Pahalwan, Pearson Publishers
9. Wireless and Mobile Communication VK Sangar, Ishan Publications.

## SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	12	25
2.	9	15
3.	10	25
4.	4	10
5.	5	10
6.	8	15
<b>Total</b>	<b>48</b>	<b>100</b>

### 5.3 INTERNET AND WEB TECHNOLOGIES

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#### RATIONALE

This course will enable the students to understand the basics of internet and various application of internet like e-mail, FTP, Telnet, Newsgroups and video conferencing. In addition, this course develops competency amongst the students to design professional web sites and interactive web pages. They will have overview of different technologies like HTML, DHTML, XML, CGI, ASP, JSP, Java Scripts, VB Scripts.

#### DETAILED CONTENTS

1. Internet Basics (08 hrs)  
 Specification and technical details for establishing Internet. Types and functions of modems, IP addressing, internet domains, domain name server, TCP/IP protocols, Internet service providers, Intranets, E-mail, Telnet, FTP, IRC, NNTP, Video conferencing, e-commerce
2. Internet Connectivity (04 hrs)  
 Telephone line, cable, leased line, ISDN, VSAT, RF link
3. World Wide Web (WWW): (08 hrs)  
 World Wide Web and its evolution, web page, web server, HTTP protocol. Examples of web servers. Navigation Tools: Mozilla Firefox, Google Chrome, Internet Explorer, Uniform Resource Locator (URL). Hypertext, hyperlinks and hypermedia, URL, its registration, browsers, search engines, proxy servers
4. Internet Security (04 hrs)  
 Basics of authentication and authorization. Introduction to firewall, various techniques of encryption and decryption, SSL (Secure Socket Layer)
5. Developing Portals Using HTML (16 hrs)  
 Introduction to HTML-5 and CSS-3 Basic structure of HTML, designing a web page, inserting links images, horizontal rules, comments. Formatting text, title, headings, colours, fonts, sizes, simple tables and forms. HTML tags, hyperlinks. Adding graphics and images, image maps, image files. Using tables, forms, style sheets and frames

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|----|--|----------|
| 6. | Client-side Scripting: Using Java Script,<br><br>Java Script Event Modeling, Document Object Model (DOM), Validating Forms using Java script | (08 hrs) |
| 7. | Server-side Scripting: `<br><br>PHP: GET POST Method, Control Structures   | (08 hrs) |
| 8. | Dream weaver: Basic features of Dreamweaver  | (08 hrs) |

### LIST OF PRACTICALS

1. Configuring computer system to access internet
2. Managing social networking profile and e-mail account
3. Using WWW for accessing relevant information
4. To demonstrate the use of TELNET, FTP, IRC
5. Creating Web pages using HTML
6. Creating web pages using Dream Weaver
7. Demonstration of audio-video conferencing
8. Demonstration of e-commerce transaction
9. Validation of user queries and responses in the Forms using Java Script or VB script
10. Create a Homepage with frames, animation, background sound and hyperlinks
11. Develop hitometer for each client i.e. number of visitors. Visit to a site.
12. Designing simple server side program which accept some request from the client and respond
13. Establishing sessions between servers and clients
14. Design fill-out form with text, check box, radio buttons etc and embed Java script to validate users input.
15. Develop simple server side program in Server Script which accept some request from the client and respond.
16. Develop interface with database (MYSQL etc) for online retrieval and storage of data through PHP

### INSTRUCTIONAL STRATEGY

Students should be exposed to Internet as the subject is practice oriented, theoretical Instruction may be given during practical session also.

### RECOMMENDED BOOKS

1. Internet and Web Technologies by Rajkamal, Tata McGraw Hill Education Pvt Ltd , New Delhi
2. Internet 6-in-1 by Kraynak and Habraken, Prentice Hall of India Pvt. Ltd., New Delhi

3. Using the World Wide Web, (IInd edition) by Wall, Prentice Hall of India Pvt. Ltd., New Delhi
4. Internet for Everyone by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., New Delhi
5. Practical Guide and Internet by AB Tiwana; Galgotia Publications Pvt. Ltd., New Delhi
6. HTML – 4 for World Wide Web by Castro Addison Wesley (Singapore) Pvt. Ltd., New Delhi
7. Principles of Web Designing Joel Sklar, Web Warrior Series Available with Vikas Publishing House Pvt. Ltd., New Delhi
8. Teach Yourself HTML 4.0 with XML, DHTML and Java Script by Stephanie, Cottrell, Bryant; IDG Books India Pvt. Ltd., New Delhi
9. Dynamic Web Publishing – Unleashed Tech Media
10. Using Active Server Pages by Johnson et.al. Prentice Hall of India, New Delhi
11. Web Development with Visual Basic with CD ROM by Chapman; Prentice Hall of India, New Delhi
12. Java Server Pages (JSP) by Pekowsky Addison Wesley (Singapore) Pvt. Ltd., New Delhi
13. Active Server Pages (ASP) by Keith Morneau Jill Batistick Web Warrior Series Available with Vikas Publishing House Pvt. Ltd., New Delhi
14. ASP Unleashed Tech Media Publication
15. JSP O'Reilly SPD Publishers Hans Bergsten
16. Web Technologies by Ivan Bayross.

#### **SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPER SETTER**

<b>Topic No.</b>	<b>Time Allotted (Hrs)</b>	<b>Marks Allotted (%)</b>
1-4	24	40
5-6	24	40
7-8	16	20
<b>Total</b>	<b>64</b>	<b>100</b>



## Elective-I

### 5.4 (a) OPEN SOURCE TECHNOLOGIES

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#### RATIOANLE

This course should provide the students with a fairly good knowledge and understanding of Open Source Software. After completion of this subject students should be able to use copyright free Open Source Software (OSS).

#### DETAILED CONTENTS

1. Introduction (05 hrs)  
Open Source Origins, Differences among Open Source, freeware, proprietary and other software. Principle and Techniques of Open Source Development, Issues in Open Source Software Development.
2. Legal Issues (04 hrs)  
Copyright and IPR, Open Source Licenses, Open Standards
3. Open Source Operating Systems (12 hrs)  
Linux's History and flavors, Installation of Libux: File system of linux, Network & packages Configuration, LILO, GRUB, Linux's fdisk. Overview of Linux structure, general purpose Linux commands; working with editor. Introduction to Open Office, Introduction to c/c++ programming in linux environment, shell programming.
4. Internet-The technology (04 hrs)  
Open standards. W3C Protocols. Role of XML in Open Source Software Development.
5. Open Source Database (07 hrs)  
Introduction to MySQL, Database design and development using MySQL
6. Open Source Web Development Tools (10hrs)  
PHP syntax (variables, control structures, functions), File Handling: Uploading files, Using PHP to open read, write and close external files and manipulate data. Security: Avoiding security pitfalls by careful coding.
7. Case studies related to successful implementation of open source software. (6 hrs)

## RECOMMENDED BOOKS

1. Elizabeth Narmore, Jason Gerner, Yann Le Scouarnec, Jeremy Stolz, Michael K. Glass. Beginning PHP5, Apache, MySQL Web Development, Wiley Publishing Inc.
2. Graham Glass, King Ablas Unix for Programmers and Users, Pearson Education

## REFERENCES

1. [www.opensource.org](http://www.opensource.org)
2. [www.w3.org](http://www.w3.org)

## LIST OF PRACTICALS

1. To install linux/fedora/ubunter and understand its file system i.e. ext2, ext3.
2. To configure LINUX OS using LILO, Grub.
3. Introduction of LINUX shell-(Korn, Bourne, C Shell) and using shell commands.
4. To use XML and prepare database in XML.
5. To use MySQL and create tables in MySQL.
6. To prepare Web page using PHP.
7. To prepare Web forms using PHP and store database in MySQL.
8. To install, use open office and compare its features with MS office.

## SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1.	05	10
2.	04	08
3.	12	25
4.	04	10
5.	07	15
6.	10	20
7.	06	12
<b>Total</b>	<b>48</b>	<b>100</b>

## 5.4 (b) DATA WAREHOUSING & MINING

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### RATIONALE

The Course is aimed to provide the students a brief knowledge of storing and retrieving data in a data warehouse in an efficient manner using different methodologies. After completion of the course, the students will be able to process the data and easily prepare the enterprise reports etc.

### DETAILED CONTENTS

1. Introduction (06 hrs)  
Introduction to RDBMS, Data Warehouse, Transactional Databases, Introduction to OLTP and OLAP
2. Data Warehouse (16 hrs)  
Difference from traditional databases, Role of Data Warehousing Introduction to data and dimension modeling, multidimensional data model, ER Modeling vs. multi dimensional modeling, concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema, Data Warehouse architecture, ROLAP, MOLAP, HOLAP, Data Warehouse Implementation, Data Cube, Metadata Repositories, OLAM.
3. Data Processing (06 hrs)  
Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and concept hierarchy generation.
4. Basics of Data Integration (Extraction Transformation Loading) (08 hrs)  
Concepts of data integration need and advantages of using data integration, introduction to common data integration approaches, introduction to ETL, Introduction to data quality, data profiling concepts and applications.
5. Basics of Enterprise Reporting (04 hrs)  
Introduction to enterprise reporting, concepts of dashboards, balanced scorecards, introduction to Reporting Architecture.
6. Data Mining Architecture (08 hrs)  
Data Mining Functionalities, Interestingness of pattern, classification of data mining system, major issues Data Mining primitives, Task relevant data, interestingness measures, presentation and visualization of patterns, Data Mining Architecture, Concept, Description,

Data Generalization and Summarization, Attributed oriented induction, Analytical characterization, Mining class comparisons.

### LIST OF PRACTICALS

1. To prepare multidimensional model for a given database problem.
2. To prepare concept hierarchy, star, snowflake model.
3. To use open source software such as Pentaho, Kettle for Data Integration.
4. To perform Data Transformation using Pentaho software.
5. To prepare Data Reports using Microsoft SQC server Reporting services.
6. To use Data Mining Software such as WEKA Rapid Mines or SPSS, Mathematica.

### RECOMMENDED BOOKS:

1. Data Mining: Concepts and Techniques By J.Han and M.Kamber By Morgan Kaufman publishers, Harcourt India Pvt. Ltd. Latest Edition.
2. Data Mining Introductory and Advance Topics By Dunham, Pearson Education, Latest Edition.
3. Business intelligence for the enterprise by Mike Biere, Addison Weseley, August 2010

### SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPER SETTER

Sr No	Topic	Time Allotted (Hrs)	Marks Allotted (%)
1	Introduction	06	15
2	Data Warehouse	16	30
3	Data Processing	06	15
4	Basics of Data Integration (Extraction Transformation Loading)	08	15
5	Basics of Enterprise Reporting	04	10
6	Data Mining Architecture	08	15
	<b>Total</b>	<b>48</b>	<b>100</b>

## 5.4(c) NETWORK OPERATING SYSTEM

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### RATIONALE

This course will enable the students to;

- i) Install and manage Linux server
- ii) Install and manage Windows server
- iii) Install and manage linux network servers

The students will be able to create use and give the different access and authority compatibility of different software with Linux and Windows NT

### DETAILED CONTENTS

#### *Linux Operating System*

1. System Administration (8 hrs)  
Linux server feature, comparison with other server, hardware requirements, system management, managing users; installing and managing devices
2. Samba server and other servers available in linux, managing administration tools (6 hrs)
3. Network Server (10 hrs)  
Telnet Server, FTP Server, Named (DNS) Server, DHCP Server, SMTP (Sendmail, postfix), Secure shell (SSH) Server, NIS, NFS, Apache Web Server, Squid Proxy Server

#### *Windows Network Operating System*

4. Introduction (8 hrs)  
Windows network server, its features and capabilities; comparison with other servers, hardware requirements
5. Installing Windows Server (8 hrs)  
Installing server, removing server
6. Configuring Windows Server (8 hrs)  
Drivers, control panel programs; other control panels

Note : Latest release of windows network operating system should be covered

## LIST OF PRACTICALS

### Linux Server

1. Installing Linux
2. Installing and configuring X-windows
3. Installing sound drivers
4. Creating and managing user accounts
5. Establishing internet connection
6. Uninstalling linux server
7. Installing and configuring Mail server (send mail)
8. Installing and configuring ssh server
9. Installing and configuring DHCP server
10. Installing and configuring DNS server

### Windows Server

11. Installing windows server
12. Uninstalling windows server
13. Configuring windows server for drivers and control panel
14. Creating and managing user accounts
15. Creating and managing files and folders through windows explorer

## INSTRUCTIONAL STRATEGY

As the subject is for studying the various methods operating systems so the teacher should differentiate between various servers clearly which server is advantageous in a particular scenario. Live demonstration sessions can be done with the help of LCD projector.

## RECOMMENDED BOOKS

1. Linux; The complete Reference by Richard Peterson; Tata McGraw Hill, New Delhi
2. Operating System Concepts by Silberschatz; Wiley India Pvt Ltd., Delhi
3. Windows Server 2008 Administration in simple steps, Steve Segues Dreamtech Press, Daryaganj, New Delhi
4. Windows 2000 Study Guide; BPB Publication, New Delhi
5. CISCO Network Design Handbook by Michal Salvagno, IDG Books India Pvt. Ltd. Delhi
6. Linux; Install and Configuration Black Book by Dee AnnleblanC and Issac Yates; IDG Books India Pvt. Ltd., Delhi
7. Linux; Network Services – Craig Hunt BPB Publication.
8. Windows Server 2008 in simple steps, Marty Malthews, Dreamtech Press, Daryaganj, New Delhi

**SUGGESTED DISTRIBUTION OF MARKS**

<b>Topic No.</b>	<b>Time Allotted (Hrs)</b>	<b>Marks Allotted (%)</b>
1.	8	10
2.	6	10
3.	10	20
4.	8	20
5.	8	20
6.	8	20
<b>Total</b>	<b>48</b>	<b>100</b>

## 5.4 (d) SOFTWARE TESTING AND QUALITY ASSURANCE

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### RATIONALE

The Course is aimed at teaching different techniques of testing a software after it is developed and to teach about various quality standards of a product. After completion of the course, the students will be able to design efficient test-cases for different software and compare it to the standard quality measures.

### DETAILED CONTENTS

1. Introduction (07 hrs)  
Review of Software Engineering, Software Process Models, Metrics, Importance of Software Testing and Quality Assurance.
2. Software Quality Assurance Concepts and Standards (07 hrs)  
Definition of Quality, Quality Concepts, Quality Control, Quality Assurance, SQA Activities, Software Reviews, Inspections, Walkthroughs, Formal Technical Reviews, Review Guidelines, Quality Assurance Standards, ISO 9000, ISO 9001:2000, ISO 9126, CMM, TQM, TQM principles, Six Sigma, SPICE.
3. Risk Management and Configuration Management (06 hrs)  
Types of Software Risks, Risks Identification, Risk Projection, Risk Refinement, The RMMM Plan, Software Configuration Management, Baselines, Software Configuration Items, SCM Process: Version Control, Change Control.
4. Software Testing (07 hrs)  
Testing Fundamentals, Verification and Validation, Test Strategies for Conventional and Object Oriented Software, Unit Testing, Integration Testing, Validation Testing, Alpha and Beta Testing, Recovery Testing, Security Testing, Stress Testing, Performance Testing, Debugging Process, Debugging Strategies.
5. Testing Techniques (08 hrs)  
Black Box and White Box Testing techniques, Flow Graph Notation, Basis Path Testing, Control Structure Testing, Equivalence Partitioning, Boundary Value Analysis, Object Oriented Testing Methods: Applicability of Conventional Test Case Design Methods, Fault-Based Testing, Scenario-Based Testing, Random Testing and Partition Testing for Classes, Interclass Test Case Design.
6. Testing Process (07 hrs)  
Test Plan Development, Requirement Phase, Design Phase and Program Phase Testing,



Testing Tools, Features of test tools, guidelines for selecting a test tool, advantages and disadvantages of using testing tools, testing using automated tools.

7. Testing Specialized Systems (06 hrs)

Testing Client/Server Systems, Testing Web based Systems, Testing Off-the-Shelf software.

## **PRACTICALS**

1. Study of open source quality assurance and software testing tools.
2. Use of software testing tools like CPPUNIT, JUnit.
3. Use of configuration management tools like CVS, VSS.
4. Applying white box testing techniques to programs involving the use of control structures, pointers, arrays, structures, files etc.
5. Applying white box testing techniques to programs involving the use of object oriented concepts like encapsulation, abstraction, inheritance, polymorphism etc.
6. Applying black box testing techniques to programs involving the use of control structures, pointers, arrays, structures, files etc.
7. Applying black box testing techniques to programs involving the use of object oriented concepts like encapsulation, abstraction, inheritance, polymorphism etc.

## **RECOMMENDED BOOKS**

1. M.G. Limaye, Software Testing: Principles, Techniques and Tools, Tata McGraw Hill, 2009.
2. R.S. Pressman, Software Engineering: A Practitioner's Approach, Sixth Edition, Tata McGraw-Hill.
3. William E. Perry, Effective Methods for Software Testing, Second Edition, John Wiley & Sons.
4. Ian Sommerville, Software Engineering, Seventh Edition, Pearson Education.
5. Paul C. Jorgensen, Software Testing: A Craftsman's Approach, Third Edition, Auerbach Publications.
6. Daniel Galin, Software Quality Assurance: From theory to implementation, Pearson Education.
7. K.K. Aggarwal, Yogesh Singh, Software Engineering, Second Edition, New Age International.

8. Nina S Godbole, Software Quality Assurance-Principles and Practice, Narosa.
9. Boris Beizer, Software Testing Techniques, Second Edition, Dreamtech.

#### **SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING THE PAPER SETTER**

<b>Sr No</b>	<b>Topic</b>	<b>Time Allotted (Hrs)</b>	<b>Marks Allotted (%)</b>
1	Introduction	07	10
2	Software Quality Assurance Concepts and Standards	07	15
3	Risk Management and Configuration Management	06	15
4	Software Testing	07	15
5	Testing Techniques	08	20
6	Testing Process	07	15
7	Testing Specialized Systems	06	10
	<b>Total</b>	<b>48</b>	<b>100</b>

## 5.5 E-COMMERCE

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### RATIONALE

“Electronic Commerce” or “Doing, business online” is becoming critical in three inter-related dimensions. Customer-to-business interactions, customer-to-customer, intra-business interactions and business-to-business interactions. Electronic Commerce facilitates the network form of organization where small flexible firms rely on other partner companies for component supplies and product distribution to meet changing customer demand more effectively. The transaction management aspect of electronic commerce enables firms to reduce costs by enabling better coordination in sales, production and distribution processes and automated supply chain network. Electronic Data Interchange (EDI), Electronic Mail and Electronic Fund Transfer (EFT), streamline business process, reduces paperwork and increase automation. The course will enable the students to understand e-commerce, its applications, the processes and the security issues.

1. Introduction (06 hrs)  
Electronic commerce and physical commerce, The DIGITAL phenomenon, Looking at e-commerce from different perspectives, Different types of e-commerce, Examples of the types of e-commerce, Some e-commerce scenarios, Effect of e-commerce, Advantages of e-commerce, Myths about e-commerce development and implementation
2. Server-side programming (10 hrs)
  - Servlet fundamentals. Overview of Java servlet, Java servlet architecture, Overview of the servlet API and examples.
  - Database connectivity. Introduction, Relational database system, JDBC perspectives, A JDBC program examples.
  - Session tracking. Introduction, Traditional session tracking techniques. The servlet session tracking API, Summary
3. Internet payment systems. (10 hrs)  
Characteristics of payment system, 4C payment methods, SET Protocol for credit card payment, E-check, E-cash, Micropayment system, Overview of Mondex
4. Consumer oriented e-commerce (6 hrs)  
Introduction, Traditional retailing and e-retailing, Benefits of e-retailing. Key success factors, Models of e-retailing, Features of e-retailing, Developing a consumer-oriented e-commerce system, The PASS model
5. Business-oriented e-commerce (4 hrs)  
Features of B2B e-commerce, Business models, Integration
6. E-service. (4 hrs)

Categories of e-services, Web-enabled services, Matchmaking services, Information-selling on the web, E-entertainment, Auctions and other specialized services, e-governance, issues, latest scenario of E-commerce in India

7. Web advertising and web publishing (8 hrs)  
 Traditional versus internet advertising, Internet advertising techniques and strategies, Business models for advertising and their revenue streams, pricing models and measurement of the effectiveness of advertisements, Web publishing, goals and criteria, Web site development methodologies, Logical design of the user interface I – abstract user interface object. Logical design of the user interface II – flow of interaction. Usability testing and quality assurance, Web Presence and visibility, legal and social issues.

### **LIST OF PRACTICAL**

1. Visit most popular e-commerce sites on the internet and comment on their design related issues
2. Create a site which enables the acceptance of credit card
3. Create a site that includes shopping card to shop on any e-shop
4. List down the security level of various sites their strengths and limitations
5. How you can integrate an e-commerce site with other sites to make a distributed network

### **INSTRUCTIONAL STRATEGY**

The teacher should take the help of internet and latest trends to teach this subject effectively. Every topic should be completed with suitable examples and case studies

### **RECOMMENDED BOOKS**

1. Electronic Commerce – A Manager's Guide by Ravi Kalakota and Andrew B. Whinston; Addison Wesley (Singapore) Pvt Ltd, New Delhi
2. "E-Business – Roadmap for Success" by Ravi Kalakota and Maxia Robinson; Addison Wesley (Singapore) Pvt Ltd, New Delhi
3. E-Business (R) Evolution by Amor; Addison Wesley (Singapore) Pvt Ltd, New Delhi
4. Ontiers of Electronic Commerce by Ravi Kalakota and Andrew B. Whinston; Addison Wesley (Singapore) Pvt Ltd, New Delhi
5. E-Business with Net Commerce (with CD) by Shurety; Addison Wesley (Singapore) Pvt Ltd, New Delhi
6. E-commerce: Fundamentals and Applications by Henry Chan, Praymond Lee, Tharam Dillon, Elizabeth Chang, ISBN, 0-471-49303-1, Wiley Eastern Publication

**SUGGESTED DISTRIBUTION OF MARKS**

<b>Topic No.</b>	<b>Time Allotted (Hrs)</b>	<b>Marks Allotted (%)</b>
1.	6	10
2.	10	20
3.	10	20
4.	6	15
5.	4	10
6.	4	10
7.	8	15
<b>Total</b>	<b>48</b>	<b>100</b>

## 5.6 MINOR PROJECT WORK

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- - 6

Minor project work aims at exposing the students to the various industries dealing with computers. It is expected from them to get acquainted with computer environment possess desired attitudes. For this purpose student during middle of the course are required to be sent for a period of two to four weeks at a stretch in different establishments. Depending upon the interest of students they are sent for exposure to:

- 1) Industrial practices in installation and maintenance of computers and computer networks
- 2) Fabrication of computers
- 3) Fault diagnosis and testing of computers
- 4) Industrial practices in respect of documentation and fabrication
- 5) A variety of computers and peripherals in assembly organizations
- 6) Software package development organizations
- 7) Maintenance of database
- 8) Write be stored procedure or functions which can be attached as the library objects to the main projects
- 9) Write a procedure function to convert number of words.
- 10) Write a procedure function to convert all data function (create your own) Database connectivity, (SQL server, Oracle, Access), Library classes in C++ (same application)., use of graphics in C++, Encryption decryption program, Active-X controls in VB.

**Note:** The teachers may guide /help students to identify their minor project work and chalk out their plan of action well in advance.

As a minor project activity each student is supposed to study the operations at site and prepare a detail project report of the observations/processes/activities by him/her. The students should be guided by the respective subject teachers; each teacher may guide a group of 4 to 5 students.

The teachers along with field supervisors/engineers will conduct performance assessment of students. Criteria for assessment will be as follows:

Sr No	Criteria	Weightage
1.	Attendance and Punctuality	15%
2.	Initiative in performing tasks/creating new things	30%
3.	Relation with people	15%
4.	Report Writing	40%

## **PERSONALITY DEVELOPMENT CAMP**

This is to be organized at a stretch for two to three days during fifth or sixth semester. Extension Lectures by experts or teachers from the polytechnic will be delivered on the following broad topics. There will be no examination for this subject.

1. Communication Skills
2. Correspondence and job finding/applying/thanks and follow-up
3. Resume Writing
4. Interview Techniques: In-Person interviews; telephonic interviews, panel interviews; group interviews and video conferencing etc.
5. Presentation Techniques
6. Group Discussions Techniques
7. Aspects of Personality Development
8. Motivation
9. Leadership
10. Stress Management
11. Time Management
12. Interpersonal Relationship
13. Health and Hygiene