

PUNJABI UNIVERSITY, PATIALA

**ORDINANCES
AND OUTLINES OF TESTS,
SYLLABI AND COURSES OF READING**

**FOR
MASTER OF SCIENCE (IT)
SECOND YEAR
(III & IV Semester)
2011-12 AND 2012-13 SESSIONS**

**DEPARTMENT OF COMPUTER SCIENCE
PUNJABI UNIVERSITY
PATIALA**

M.Sc. (IT)
(Semester System)
IIND Year (III & IV Semester)
2011-12 AND 2012-13 SESSIONS

2nd Year Semester System-III			
MS-211 Computer Graphics	5	80	20
MS-212 Java Programming	5	80	20
MS-213 Artificial Intelligence	5	80	20
MS-214 Computer Networks	5	80	20
MS-215 Programming Lab-IV	8	60	40
MS-216 Programming Lab-V	8	60	40
Semester System-IV			
MS-221 E-Commerce	5	80	20
MS-222 Software Engineering	5	80	20
MS-223 LINUX Administration	5	80	20
MS-224 Programming Lab-VI	8	60	40
MS-225 Project	10	200	

The Project will involve development of application/System Software in Industrial/Commercial/Scientific Environment.

CONTINUOUS ASSESSMENT (THEORY PAPERS)

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| 1. | Two or three tests out of which minimum two will be considered for assessment. | 60% of the marks allotted for Continuous Assessment |
| 2. | Seminars/Assignments/Quizzes | 30% of the marks allotted for Continuous Assessment. |
| 3. | Attendance, class participation and behaviour | 10% of the marks allotted for Continuous Assessment. |

MS-211 Computer Graphics

Maximum Marks: 80
Minimum Pass Marks: 35%
40-45

Maximum Time: 3 Hrs.
Lectures to be delivered:

A) Instructions for paper-setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Graphics Hardware: The Functional characteristics of the systems are emphasized.
Input devices: Keyboard, Touch panel, Light pens, Graphic tablets, Joysticks, Trackball, Data glove, Digitizer, Image scanner, Mouse, Voice Systems.
Hard copy devices: Impact and non impact printers, such as line printer, dot matrix, laser, ink-jet, electrostatic, flatbed and drum plotters.
Video Display Devices: Refresh cathode -ray tube, raster scan displays, random scan displays, colour CRT-monitors, direct view storage tube, flat-panel displays, 3-D viewing devices, virtual reality, raster scan systems, random scan systems, graphics monitors and workstations.

SECTION B

Scan conversion algorithms for line, circle and ellipse, Bresenham's algorithms, area filling techniques, character generation.

2-dimensional Graphics: Cartesian and Homogeneous co-ordinate system, Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Composite transformations, affine transformation, Two dimensional viewing transformation and clipping (line, polygon and text).

SECTION C

3-dimensional Graphics: Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Composite transformations, Mathematics of Projections (parallel & perspective). 3-D viewing transformations and clipping.

SECTION D

Hidden line and surface elimination algorithms, z-buffer, scan-line, sub-division, Painter's algorithm.

Illumination Models: Diffuse reflection, Specular reflection, refracted light, texture surface patterns, Halftoning, Dithering.
Surface Rendering Methods: Constant Intensity method, Gouraud Shading, Phong Shading.

References:

1. D. Hearn and M.P. Baker, "Computer Graphics", PHI New Delhi; Second Edition, 1995.

2. J.D. Foley, A.V. Dam, S.K. Feiner, J.F. Hughes, R.L Phillips, "Introduction to Computer Graphics", Addison-Wesley Publishing company, N.Y.; Second Edition, 1994.
3. R.A. Plastock and G. Kalley, "Computer Graphics", McGraw Hill, 1986.

MS-212 Java Programming

Maximum Marks: 80
Minimum Pass Marks: 35%
40-45

Maximum Time: 3 Hrs.
Lectures to be delivered:

A) Instructions for paper-setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

Section-A

Introduction to Java, Why java is important to the Internet, Object Oriented Programming, Data types, Variables, Arrays, the Simple types, Floating Point Types, Operators, Arithmetic Operators. The Bit wise operators, Relational Operator's, Boolean, Logical Operators, Control Statements.

Section-B

Introducing Classes : Class fundamentals, declaring objects, Assigning object Reference, Variables, Introducing Methods, Constructors, this keyword, Garbage collection, Overloading Using Objects and parameters, Argument Passing, Returning Objects, Recursion, Access Control, Static, Nested & Inner Classes. Exploring String class using command line Arguments. Inheritance.

Section-C

Packages : Defining a package, CLASSPATH, Access protection, Importing Packages, Defining an interface, Implementing Interface. Exception handling fundamentals, Exception types, using try & catch, throw, throws, Java's Built in Exceptions, Creating your own Exception subclasses.

Section-D

Threading, Multithreading, Applets, Event handling, Introduction of AWT.

Reference :

1. Patrick Naughton and Herbert Schildt, "The Complete Reference Java 2", Tata McGraw Hill, 1999.
2. Lemay, L. : Teach yourself Java in 21 days, Tech.
3. Griffith : 1001 Java Programming Tips.
4. Sulalman : Java Programmers Library.

MS-213 Artificial Intelligence

Maximum Marks: 80
Minimum Pass Marks: 35%
40-45

Maximum Time: 3 Hrs.
Lectures to be delivered:

A) Instructions for paper-setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION-A

Introduction to AI : Definition, Nilsson's Onion Model explaining basic Elements of AI and AI application Areas.

Introduction to Propositional Logic: Syntax, Semantics, Inference methods in Propositional Logic.

Introduction to Predicate Logic: Syntax, Semantics of Predicate Logic, Clausal form, Resolution, Unification, Inference Mechanisms.

SECTION-B

Knowledge Based Systems : Meaning of Knowledge, Types of Knowledge, Components of Knowledge Base System.

Knowledge Representation : Approaches to Knowledge representation, Issues in Knowledge representation, Knowledge representation using rules. Semantic Nets, Frames, Conceptual Dependencies, Scripts, CYC.

Knowledge Acquisition : Definition, General Learning Model, Types of Learning, Factors affecting Learning.

Knowledge organization & Manipulation: Introduction, Issues in organization and manipulation.

SECTION-C

Dealing with uncertainty: Symbolic reasoning under uncertainty-Introduction and logics for Non-monotonic reasoning, Implementation issues.

Prolog Programming

SECTION-D

Expert systems : Basic Components & architecture of Expert systems, representing and using domain knowledge, ES-Shells.

Applications of AI : Game Playing-The minmax Search Procedure, Adding Alpha-beta Cutoff's Planning-Overview, Components of Planning System, Natural Language processing : Overview, Syntactic processing, Semantic analysis, Morphological, Discourse and Pragmatic processing.

References:-

1. E. Rich and K. Knight, "Artificial Intelligence", Tata McGraw Hill.
2. E. Charniak and D. McDermott, "Introduction to Artificial Intelligence", Addison-Wesley Publishing Company.
3. Dan W. Patterson, "Introduction to Artificial Intelligence and Expert Systems", PHI.

4. W.F. Clofisin and C.S. Melifish, "Programming n PROLOG", Narosa Publishing Co.
5. Sanjiva Nath, "Turbo PROLOG", Galgotia Publications Pvt. Ltd.

MS-214 Computer Networks

Maximum Marks: 80
Minimum Pass Marks: 35%
40-45

Maximum Time: 3 Hrs.
Lectures to be delivered:

A) Instructions for paper-setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

Section A:

Computer networks: uses of computer networks, Goals and applications of networks, computer network structure and architecture, reference models: OSI model, TCP/IP model, Comparison of TCP/IP and OSI models, Introduction to Novell Netware, and ARPANET.

Section B:

Medium Access Sublayer : Static and dynamic channel allocation for LAN and MAN ALOHA Protocols, **LAN Protocols :** CSMA, CSMA/CD, Collision Free protocol, BRAP, MLMA, Binary countdown, Limited contention protocol, Urn Protocol, Adaptive tree walk protocol.

Networking and Internetworking devices: Repeater, bridges, routers, gateways, switches.

Section C:

High speed LAN: FDDI, Fast Ethernet, HIPPI, Fiber channel.

LAN IEEE 802.x standards.

Routing: Static vs. Dynamic Routing, various Routing Algorithms.

Congestion Control: Causes of Congestion, Various Congestion Control Strategies and Algorithms

Mobile telephone, mobile telephone switching office.

Section D:

Internet protocols: Principles of Internetworking, connectionless internetworking, Internet protocols, IPv6.

Network Security: Security requirements and attacks, encryption Public key encryption and digital Signatures. distributed applications: SNMP, SMTP, HTTP.

References:

1. A.S. Tannenbaum, "Computer Networks", 3rd Edition, Prentice Hall, 1999.
2. Data Communications & Networking by Forouzan, Tata McGraw Hills.
3. D.E. Corner," Computer Networks and Internet", 2nd Edition, Addison Wesley Publication, 2000.
4. D.E. Corner and D.L. Stevens, " Inter-networking with TCP-IP: Design, Implementation and Internals", Vol. II, Prentice Hall, 1990.
5. D. Bertsekas and R.Gallagar, "Data Networks", 2nd Edition, Prentice-Hall, 1992.
6. Stevens W.R., " UNIX Network Programming," Prentice Hall, 1990.

MS-215 Programming Lab-IV

Maximum Marks: 100*

Max. Time: 3 Hrs.

Minimum Pass Marks: 35%

Practical sessions to be conducted:40-45

This laboratory course will mainly comprise of exercise based on subject MS-211 named Computer Graphics and MS 213 (Artificial Intelligence)

*Maximum Marks for Continuous Assessment: 40

Maximum Marks for University Examination : 60

MS-216 Programming Lab-V

Maximum Marks: 100*

Max. Time: 3 Hrs.

Minimum Pass Marks: 35%

Practical sessions to be conducted: 40-45

This laboratory course will mainly comprise of exercise based on subject MS-212 named Java Programming.

*Maximum Marks for Continuous Assessment: 40

Maximum Marks for University Examination : 60

MS-221 E-Commerce

Maximum Marks: 80
Minimum Pass Marks: 35%

Maximum Time: 3 Hrs.
Lectures to be delivered: 40-45

A) Instructions for paper-setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION-A

E-Commerce: Definition, benefits of E-Commerce, Impact of E-Commerce, Difference between E-Commerce and traditional Commerce, E-business. Classification of E-Commerce. Architectural framework of E-Commerce, Business Models of E-Commerce: Key elements, Major B2C business Models, major B 2B business models.

SECTION-B

E-Commerce Security Environment, Dimensions of E-Commerce Security, Security threats in the E-Commerce environment, Technology. Solutions: Cryptography, Cryptographic algorithms, Encryption-Symmetric Key encryption, Public Key encryption, Encryption using Digital signatures and Hash Digests, Digital envelopes, SSL, VPN, Protecting Networks : Firewall, Proxy servers, Policies, Procedures and laws.

SECTION-C

Electronic Payment Systems : Types of payment systems, credit card E-Commerce transactions, Credit card E-Commerce enablers, limitations of on-line credit card payment systems. E-Commerce Digital payment systems in B 2C. Digital Wallets, Digital Cash. Online stored value systems, Digital credit card and checking, payment systems and the wireless web, B2B payment systems.

SECTION-D

E-Commerce marketing concepts : Basic Marketing Concepts, Internet Marketing technologies, B2C and B2B e-Commerce Marketing Strategies, Internet advertising : Models & Weaknesses, Ethical, social and political issues in E-Commerce : Privacy and Information Rights, Intellectual Property rights, Governance, Taxation, Public safety and welfare.

References:

1. E-Commerce-Business Technology, Society-Kenneth C. Landan Carol Guercio Traver Clearson Education.
2. E-Commerce : Framework, Technologies and Applications-Bharat Bhasker (Tata McGraw Hill).

MS-222 Software Engineering

Maximum Marks: 80
Minimum Pass Marks: 35%
40-45

Maximum Time: 3 Hrs.
Lectures to be delivered:

A) Instructions for paper-setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

Section A

Software Engineering : History, Definition, Goal; The role of the Software Engineer, The Software Life Cycle, The relationship of Software Engineering to other areas of Computer Science, Classification of Software Qualities, Representative Qualities, Software process models: Waterfall model, prototyping, spiral; Tools and techniques for process modeling, Management of software engineering management functions, project planning and organization.

Section B

Requirement Analysis: The requirement process, types of requirements, Characteristics and components of SRS, Data flow Diagrams, Data Dictionary, UML diagrams for specifying behaviors ,metrics, verification of SRS.

Design and Software architecture: The Software design activity and its objectives, Abstraction, Modularity, Coupling-Cohesion criteria, Object-Oriented Design: generalization and specialization, associations and aggregations.

Section C

Coding: Programming standards and procedures, programming guidelines, documentation, and Code verification techniques.

Verification and validation: Approaches to verification, testing goals, principles,

Equivalence class partitioning, Boundary value analysis, mutation testing, graph based

testing, cyclomatic complexity, test planning ,automated testing tools, features of Object-Oriented testing.

Section D

Software maintenance: The nature of maintenance, maintenance problems, maintenance techniques and tools.

Software re-engineering, reverse engineering, forward engineering: forward Engineering for Object-oriented and client/server architecture, Building blocks for CASE, CASE tools and applications.

References:

1. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, " Fundamentals of Software Engineering", 2nd edition Pearson Education. 2003.
2. Shari Lawrence Pfleeger, " Software Engineering : Theory and Practice", 2nd edition, Pearson Education, 2003.
3. P.Jalota, "An Integrated Approach to SoftwareEngineering", Narosa Publications.
4. Roger.S.Pressman," SoftwareEngineering-A practitioner's Approach", 3rd edition,McGraw-Hill.

MS-223 **Linux Administration**

Maximum Marks: 80
Minimum Pass Marks: 35%
40-45

Maximum Time: 3 Hrs.
Lectures to be delivered:

A) Instructions for paper-setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 20% marks each. Section E will have 5-10 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Introduction: Overview of Linux, Linux's History, Advantages of Linux, Minimum System Requirements; **Installing Linux:** Choosing Text or Graphics Installation, Setting up your Hard Drive, Understanding the Swap Space, Creating the Linux File-system partition, Setting up the mouse, root password and Ethernet, Configuration X, Selecting packages to Install, Creating the Boot Disk. **Using LILO boot manager:** Installing LILO, LILO make-file, Updating LILO, Removing or Disabling LILO, Troubleshooting LILO. The Boot Process, Startup Scripts, Shutdown, Halt and reboot, Creating a New Login, Virtual Terminals, Running as root.

SECTION B

Basic Linux Commands : How Linux Commands Work, Command Options & Parameters, Input and Output Redirection, Main pages, Wildcards : * and ?, Environment Variables, The process status Commands : ps, termination command : kill, the su command, the grep command.

Linux File System : Common types of files, filenames, Inodes, The root directory, How directories are named, Navigating the Linux file System : pwd command, Absolute and relative filenames; cd command, Creating and Deleting files : Cat, Creating Directories, Moving and Copying files, Moving Directories, Removing files and directories, Important directories in the Linux file System : / , /home, /bin, /usr, /usr/bin, /var/spool, /dev, /sbin, /etc.

File and Directory ownership, Groups, Changing group ownership, File Permissions, UMASK Setting, Changing File Permission, Changing directory permissions; Bash : What is Shell ? How the Shell gets Started, The most common Shells;

SECTION C

Shell Scripting: Creating and Executing Shell Programs, Using variables : Assigning a value to a variable, Accessing the value of a variable, Positional Parameters and other Built-In Shell Variables; Special Characters, Conditional Statements : if Statement , case Statement; Iteration Statements : for Statement, while Statement, until Statement, shift Command, select Statement, repeat Statement, Functions.

Editing and Typesetting : Text Editors vi, The vi Editor, Starting vi, vi modes, Inserting Text, Quitting vi, Moving the Cursor, Deleting Text, Copying and Moving Text, Searching and Replacing Text, Setting Preferences.

Configuring the X Window: Xfree86 Software Distribution, Choosing an X Server, Installing Xfree86 Manually, Installing Xfree86 using a Script, Path Environment Variable; Configuring Xfree86; The xconfig and XF86Config Files in Detail: Pathnames, Keyboard Setting, Mouse Definition, Monitor Model, Video Cards, The Xfree86 Server, Testing Xfree86 Configurations, The .xinitrc File.

SECTION D

Linux for System Administrators: System Administration Basics, The root Account, Starting and Stopping the System, Booting from a Floppy, Using LILO to Boot, Shutting Down Linux; Mounting File Systems : Mounting a Floppy, CD-ROM, Creating a New file System, Un-mounting file Systems, Backup and restore: Compressing files with gzip, Using tar and cpio; Setting up your System : Setting the System Name, Using a Maintenance Disk, Forgetting the root Password, Setting the Login Message.
Networking & Network Services: What is TCP/IP? IP Address, Ports, Sockets, Subnets, Routing, Hardware Requirements, Configuring the Network, Configuration Files, Testing and Troubleshooting, The netstart Command, ping, traceroute, Mail, News, NFS, www, FTP, Telnet, DNS.
Network Security: Firewalls.

REFERENCES:

1. Tim Parker : Linux Unleashed Third Edition, Techmedia, 1999.
2. Tackett, J : Special Edition using LINUX, PHI.
3. Norton, P. : Complete guide to LINUX, Techmedia.
4. Komarinski, M : LINUX System Administration Handbook, AW.
5. SUMITABHA DAS : UNIX Concepts & Application 2nd Edition, Tata McGraw-Hill

MS-224 Programming Lab-VI

Maximum Marks: 100*

Max. Time: 3 Hrs.

Minimum Pass Marks: 35%
60-65

Practical sessions to be conducted:

This laboratory course will mainly comprise of exercise based on subject MS-223 named LINUX Administration.

*Maximum Marks for Continuous Assessment: 20

Maximum Marks for University Examination: 80

MS-225 PROJECT

Maximum Marks : 200

Minimum Pass Marks : 35%

1. This paper will comprise of Project work carried out by the students during the fourth semester simultaneously with the regular course work. The students can undertake the Project based on any subject related to Computer Science/Applications/Information Technology. The Project should undergo all the phases of software development process, namely, Problem analysis, Design, Coding, Testing and documentation. Joint projects will be allowed and joint project reports will also be accepted. Individual project reports will be recognized and the students should highlight their contribution in a joint project report.
- 2 The student will submit three copies of the project reports. These copies need not be sent to the University. The examiners will evaluate these project reports at respective colleges and will conduct viva at colleges.
- 3 It will be conducted by two external examiners. However, the practical examination can be conducted by one external examiner, in case the second examiner fails to turn up.
- 4 Internal guide will be associated with external examiners. In case, due to any reason, if the internal guide is unable to be present, then the Principal of the College/Head of the Department can appoint internal guide.

The evaluation of the Project will be done by the external examiners only with the assistance of internal guide.