

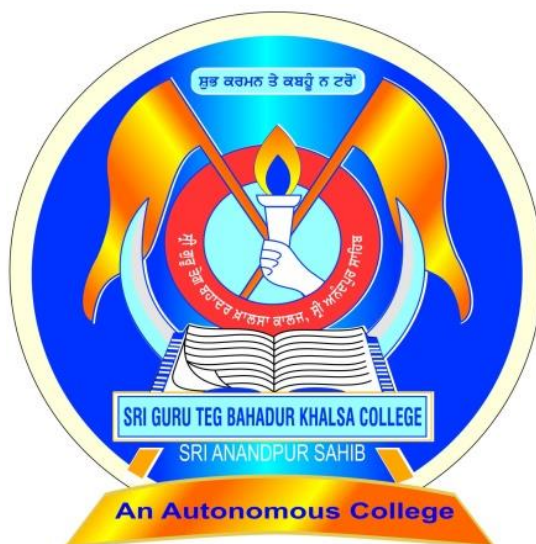
(P.G. DEPARTMENT OF COMPUTER SCIENCE)

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

FOR

**M. Sc. (IT)/ M.Sc.(IT)(LE)
(SEMESTER SYSTEM)
SECOND YEAR (Semester III & IV)
(2020-21 and 2021-22 Sessions)**

FACULTY OF COMPUTING SCIENCES



SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib

An Autonomous College

Affiliated to Punjabi University, Patiala

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SYLLABI, OULINES OF PAPERS AND TESTS
M.Sc. (IT) / M.Sc.(IT)(LE)
Part-2
(2020-21 and 2021-22 Sessions)

Semester-III										
Paper Code	Name of Subject	Contact hours per week				Examination scheme marks				Credit
		L	T	P	Total	Internal	External	Practical	Total	
MS-211	Web Technology	5			5	30	70		100	5
MS-212	Java Programming	5			5	30	70		100	5
MS-213	Computer Networks	4	1		5	30	70		100	5
MS-214	Modern Information Systems	4	1		5	30	70		100	5
MS-215	Programming Lab-IV (Web Technology)			4	4	30		70	100	2
MS-216	Programming Lab-V (Java Programming)			4	4	30		70	100	2
MS-217	CBC-III Workshop on Python Programming			2	2	50			50	2
	Total	18	2	10	30	230	280	140	650	26

Semester-IV										
Paper Code	Name of Subject	Contact hours per week				Examination scheme marks				Credit
		L	T	P	Total	Internal	External	Practical	Total	
MS-221	Computer Graphics	5			5	30	70		100	5
MS-222	Linux Administration	5			5	30	70		100	5
MS-223	Research Methodology	4	1		5	30	70		100	5
MS-224	Artificial Intelligence	4	1		5	30	70		100	5
MS-225	Programming Lab-VI (Computer Graphics)			4	4	30		70	100	2
MS-226	Programming Lab-VII (LINUX Administration)			4	4	30		70	100	2
MS-227	Minor Project			2	2	50			50	2
	Total	18	2	10	30	230	280	140	650	26

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NOTE:

The Break-up of Marks for Practical exams (External) will be as under:

1. Viva Voce (External examination)	20 Marks
2. Program Development and Execution	20 Marks
3. File Record	30 Marks

The breakup of marks for Workshop Examination will be as under

1. Practical file Evolution	15 Marks
2. Viva Voce	15 Marks
3. Program Development and Execution	20 Marks

Internal Assessment of **30%** will be based on Continuous Comprehensive Assessment (CCA) pattern and the breakup of **30%** will be as under:

Mid Semester Tests-I	25%
Mid Semester Tests-II	25%
Attendance	15%
Seminars / Projects	35%

MS-211 : Web Technology
5 CREDITS: 5H(L)

Teaching Hours per week: 5
Time Allowed: 3 Hrs.
Pass Marks: 35%

Internal Assessment: 30 Marks
External Marks: 70 Marks

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 10.5 marks for each question. Section C will consist of 7-15 short answer type questions covering the entire syllabus uniformly and will carry a total of 28 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Introductory: Internet Basics: Networks, Protocols, TCP/IP, Internet Addresses, Ports, Sockets, Name Resolution, Firewalls, Protocol Tunneling, Proxy Servers, Internet Standards, governing the web HTTP, MIME, Inside URLs, Web applications, Overview of clients/servers web communication, comparison of web servers, Common Gateway Interface CGI.

Web Page Designing: Introduction to markup languages; HTML: list, table, images, frames, forms, pages style sheets CSS;

XML: DTD, XML Namespaces, XML schemes, Presenting XML with CSS and XSLT, XML-DOM, What is XHTML?

SECTION B

Client Side Scripting: Java script: Introduction, documents, forms, statements, functions, objects; Event and event handling; Browsers and the DOM, JQuery: Syntax, Selectors, Events and AJAX methods.

Server Side Programming: PHP: Introduction, requirements, PHP syntax, data type, variables, strings, operators, if-else, control structure, switch, array, function, file handling, form, sending email, file upload, session/state management, error and exception, PHP Database for dynamic Web pages.

Reference Books :

1. Jeffrey C Jackson, "Web Technology – A computer Science perspective", Persoson Education, 2007.
2. Chris Bates, "Web Programming – Building Internet Applications, "Wiley India, 2006.
3. Xavier, C, " Web Technology and Design" , New Age International
4. Ivan Bayross," HTML, DHTML, Java Script, Perl & CGI", BPB Publication.
5. Ramesh Bangia, "Internet and Web Design" , New Age International
6. Bhave, "Programming with Java", Pearson Education
7. Ullman, "PHP for the Web: Visual QuickStart Guide", Pearson Education
8. Deitel, "Java for programmers", Pearson Education
9. Dustin R. Callaway, "Inside Servlets" Pearson Education.

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MS-212 : Java Programming
5 CREDITS: 4H(L)

Teaching Hours per week: 5
Time Allowed: 3 Hrs.
Pass Marks: 35%

Internal Assessment: 30 Marks
External Marks: 70 Marks

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 10.5 marks for each question. Section C will consist of 7-15 short answer type questions covering the entire syllabus uniformly and will carry a total of 28 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
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.

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 B

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.

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

Reference Books :

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.

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MS-213 : Computer Networks
5 CREDITS: 4H(L) + 1H(T)

Teaching Hours per week: 5
Time Allowed: 3 Hrs.
Pass Marks: 35%

Internal Assessment: 30 Marks
External Marks: 70 Marks

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 10.5 marks for each question. Section C will consist of 7-15 short answer type questions covering the entire syllabus uniformly and will carry a total of 28 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
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.

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

Multiple access protocols: ALOHA, CSMA, CSMA/CD, Collision Free protocol, BRAP, MLMA, Binary countdown.

Introduction to IEEE standards for LAN: Ethernet LAN (802.3), Token Bus (802.4), Token Ring (802.5), Wireless LAN(802.11, 802.15, 802.16) **High speed LAN:** FDDI, Fast Ethernet, Fibre channel.

SECTION B

Routing: Static vs. Dynamic Routing, various Routing Algorithms- Shortest path routing, flooding, flow based routing, distance vector routing, link state routing, routing for mobile hosts, broadcast routing, multi cast routing.

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

Internet protocols: Principles of Internetworking, connectionless internetworking, IPv4, IPv6.

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

Text Books:

1. Forouzen, "Data Communication and Networking", TMH (Fourth edition).

Reference Books:

1. A.S. Tanenbaum, "Computer Networks", Pearson Education (Fourth edition).
2. W. Stallings, "Data and Computer Communication", Macmillan Press.

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MS-214 : Modern Information Systems
5 CREDITS: 4H(L) + 1H(T)

Teaching Hours per week: 5
Time Allowed: 3 Hrs.
Pass Marks: 35%

Internal Assessment: 30 Marks
External Marks: 70 Marks

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 10.5 marks for each question. Section C will consist of 7-15 short answer type questions covering the entire syllabus uniformly and will carry a total of 28 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Introduction to Systems and Basic Systems Concepts, Types of Systems, Information Systems: Definition and Characteristics, Types of Information, Role of Information in Decision Making, Types of an Information system: Operations Support Systems and Management Support Systems, Comparison of EDP/MIS/DSS.

An overview of Management Information System: Definition and Characteristics, Components of MIS, Frame Work for Understanding MIS: Robert Anthony's Hierarchy of Management Activity, Information requirements and Levels of Management, Simon's Model of decision- Making.

SECTION B

Functional Information Systems: A Study of Marketing, Personnel, Financial and Production information systems, Input transaction documents, applications and reports of Marketing, Personnel, Financial and Production information systems. Models for functional information systems.

Concept of Knowledge: Definition and characteristics of knowledge, Difference between data, information and knowledge, Knowledge versus experience. Types of knowledge: Explicit and Tacit knowledge. Nonaka and Takeuchi theory of knowledge creation: Socialization, Externalization, Combination and Internalization (SECI) Model. Introduction to knowledge management and knowledge management systems. The process of knowledge management: Creation/ capture, storage and retrieval, transfer and application.

Text Books :

1. D.P. Goyal, "Management Information Systems: Managerial perspectives", Macmillan India Ltd.

Reference Books :

1. J. Kanter, Management information Systems, Prentice Hall of India.
2. Gordon B. Davis & M.H. Olson, Management Information Systems: Conceptual Foundation, structure & Development, McGraw Hills Publishing.

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3. Robert G. Murdick & Joel E. Ross & James R. Claggett, Information Systems for Modern Management, Prentice Hall of India.
4. W. S. Jawadekar, Management Information Systems, Tata McGraw Hill Publishing.
5. Bryan Bergeron, Essentials of Knowledge Management, John Wiley and Sons.
6. Infosys Campus Connect Foundation Program Volume 1 – 3, Education & Research Department, Infosys Technologies Ltd, Bangalore.

MS-215 : Programming Lab-IV (Web Technology)
2 CREDITS: 4H (P)

Practical Hours per week: 4
Time Allowed: 3 Hrs.
Pass Marks: 35%

Internal Assessment: 30 Marks
External Marks: 70 Marks

This laboratory course will mainly comprise of exercise based on subject MS-211 Web Technology.

*Maximum Marks for Continuous Assessment: 30

Maximum Marks for University Examination:70

MS-216 Programming Lab-V (Java Programming)
2 CREDITS: 4H (P)

Practical Hours per week: 4
Time Allowed: 3 Hrs.
Pass Marks: 35%

Internal Assessment: 30 Marks
External Marks: 70 Marks

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

*Maximum Marks for Continuous Assessment: 30

Maximum Marks for University Examination:70

MS-217 : Workshop on Python Programming
2 CREDITS: 2H (P)

Practical Hours per week: 2

Internal Assessment: 50 Marks

Time Allowed: 3 Hrs.

Pass Marks: 35%

SECTION-A

Basics of Python: Introduction to Computers, Programs and Python; syntax indentation; keywords, identifiers, assignment statements, expressions, numbers and operators, reading and manipulating console input. Making decisions: simple if statements, multiple choice decisions.

Iteration and Lists: Iteration: for and while loops, nested loops, keywords – break and continue. Lists and Tuples: Accessing sequence values, index manipulation. Comprehensive Lists and Tuples.

Functions: Functions – code reuse, defining and calling a function, return values, positional and keyword arguments, passing arguments by reference, modularizing the code, scope of variables, default arguments, returning multiple values.

SECTION-B

Classes: Classes – definition, mutable / immutable objects, data encapsulation and abstraction, object-oriented thinking.

Strings and Formatting : Strings: len, min, max functions, indexing, slicing, concatenation, in / not in operator, comparing strings. Substring search and split functions.

Formatting: the format() method, arguments- format field names. Formatting numbers and strings: rounding, precision, scientific notation, percentage, width and justify.

Text Books

1. Introduction to Programming Using Python, First Edition by Y. Daniel Liang,©2013 Prentice Hall
2. Dawson, Michael. Python Programming for the Absolute Beginner (3rd ed.). Boston, MA: Course Technology, 2010.

Reference Books:

1. Shaw, Zed A., 2012. Learn Python the Hard Way, Second Edition, Shavian Publishing, LLC, 183 p

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MS 221 : Computer Graphics
5 CREDITS: 5H(L)

Teaching Hours per week: 5
Time Allowed: 3 Hrs.
Pass Marks: 35%

Internal Assessment: 30 Marks
External Marks: 70 Marks

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 10.5 marks for each question. Section C will consist of 7-15 short answer type questions covering the entire syllabus uniformly and will carry a total of 28 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Introduction to computer Graphics systems, Application areas.

Graphics Hardware: The Functional characteristics of the systems are emphasized

Input devices: Keyboard, Touch panel, Light pens, Graphic tablets, Joysticks, Data glove, Image scanner, Mouse.

Hard copy devices: Impact and non impact printers, such as line printer, dot matrix, laser, inkjet, electrostatic, flatbed and drum plotters.

Video Display Devices: Refresh cathode ray tube, raster scan displays, random scan displays, color CRT monitors, DVST, flat-panel displays, virtual reality, raster scan systems, Frame buffer and video controller.

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

SECTION B

2-dimensional Graphics: Cartesian and Homogeneous co-ordinate system, Matrix representation, Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Composite transformations, Affine transformation, Viewing transformation, 2D clipping algorithms (Cohen Sutherland and Liang Barsky's line clipping algorithms), polygon and text clipping.

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

Reference Books :

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.

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MS-222 : LINUX Administration
5 CREDITS: 5H(L)

Teaching Hours per week: 5
Time Allowed: 3 Hrs.
Pass Marks: 35%

Internal Assessment: 30 Marks
External Marks: 70 Marks

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 10.5 marks for each question. Section C will consist of 7-15 short answer type questions covering the entire syllabus uniformly and will carry a total of 28 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
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.

Basic Linux Commands : How Linux Commands Work, Command Options & Parameters, Input and Output Redirection, Mian 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 B

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.

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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.

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-223: Research Methodology
5 CREDITS: 4H(L)+1H(T)

Teaching Hours per week: 5
Time Allowed: 3 Hrs.
Pass Marks: 35%

Internal Assessment: 30 Marks
External Marks: 70 Marks

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 10.5 marks for each question. Section C will consist of 7-15 short answer type questions covering the entire syllabus uniformly and will carry a total of 28 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Objectives and types of research: Definition and types of research (Descriptive and analytical research, applied and fundamental research, qualitative and quantitative research, conceptual and empirical research).

Research problem formulation: Defining and formulating research problem and its necessity, selecting the problem, literature review and its importance; Primary and secondary data sources-library (books, journals, periodicals, reference sources, abstracting and indexing sources, reviews, monographs), patents, web (search engines, online libraries, online journals, e-books, e-encyclopedia, institutional websites); Journals and books-standards of research journals (impact factor, ISSN, ISBN, online and print journals, indexed journals, peer reviewed journals), citation index, H-index; Identifying gaps areas from literature review.

Research design and methods: Developing the research hypothesis; Research design – basic principles and need, important concepts; Observations and facts, laws and theories, prediction and explanation, induction, deduction; Development of models, developing a research plan, exploration, description, diagnosis, experimentation.

Data collection: Execution of research, observation and collection of data, methods of data collection, primary data, secondary data.

Documentation: Techniques and importance of documentation; Role of internet, information technology and computers in research and documentation.

SECTION-B

Reporting and thesis writing: Structure and components of research report, types of report-monographs, review articles, research papers, thesis, books, technical reports and their significance; Different steps in preparation of a written scientific document- layout, structure and language of reports, illustrations and tables, bibliography, references, footnotes.

Presentation of research papers: Poster presentations-layout and format; Oral presentation-planning, preparation, use of visual art, importance of effective communication.

Application of intellectual property rights: Commercialization, copyright, royalty, intellectual property rights and patent law; Plagiarism-concept and authentication of originality of research; Citation and acknowledgement; Reproducibility and accountability.

Cost analysis of project: Cost incurred on raw materials, different testing procedures, cost of instrumentation, downstream processing cost (wherever required); Cost of clinical trials.

Research grants: National/International funding agencies; Government and private bodies.

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RECOMMENDED READING

1. Statistics – An Introductory Analysis by Taro Yamane, Harper International Edition, 1994.
2. An Introduction to Statistical Methods by C.B. Gupta, Vikas Publ. Co., Jalandhar, 1997.
3. Research Methodology: Methods and Techniques by CR Kothari and Gaurav Garg by NewAge International Publishers (Third Edition), ISBN-10:8122436235, ISBN-13:978-8122436235
4. Research Methodology: A step-by-step Guide for Beginners by Ranjit Kumar, SAGE Publications, ISBN-13: 978-1849203012

MS- 224 : Artificial Intelligence
5 CREDITS: 5H(L)

Teaching Hours per week: 5
Time Allowed: 3 Hrs.
Pass Marks: 35%

Internal Assessment: 30 Marks
External Marks: 70 Marks

A) INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three Sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 10.5 marks for each question. Section C will consist of 7-15 short answer type questions covering the entire syllabus uniformly and will carry a total of 28 marks.

B) INSTRUCTIONS FOR THE CANDIDATES

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory question of Section C.
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.

Logical Reasoning: 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.

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 B

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

Prolog Programming : Features of Prolog, Elementary Data Types, Compound objects in Prolog, Writing simple program in Prolog, Understanding Default flow control of the Prolog Program, Controlling Program Flow with cut and fail, List Manipulation, String manipulation, Arithmetic operators, Input /Output statement.

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.

Reference Books :-

1. E. Rich and K. Knight, "Artificial Intelligence", Tata McGraw Hill.
2. E. Charnaik and D. McDermott, "Introduction to Artificial Intelligence", Addison-Wesley Publishing Company.

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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-225 : Programming Lab-VI (Computer Graphics)
2 CREDITS: 4H (P)

Practical Hours per week: 4
Time Allowed: 3 Hrs.
Pass Marks: 35%

Internal Assessment: 30 Marks
External Marks: 70 Marks

This laboratory course will mainly comprise of exercise based on subject MS-221: Computer Graphics.

*Maximum Marks for Continuous Assessment: 30

Maximum Marks for University Examination: 70

MS-226 : Programming Lab-VII (LINUX Administration)
2 CREDITS: 4H (P)

Practical Hours per week: 4
Time Allowed: 3 Hrs.
Pass Marks: 35%

Internal Assessment: 30 Marks
External Marks: 70 Marks

This laboratory course will mainly comprise of exercise based on subject MS-222 : LINUX Administration.

*Maximum Marks for Continuous Assessment: 30

Maximum Marks for University Examination: 70

MS-227 : Minor Project
2 CREDITS: 4H (P)

Practical Hours per week: 2
Time Allowed: 3 Hrs.
Pass Marks: 35%

Internal Assessment: 50 Marks

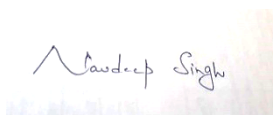
In this laboratory course, the students have to work on a Minor Project which will be based on applications of Linux or Computer Graphics. The student have to submit a project report with their applications.

Members of Board of Studies

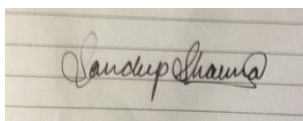
1. Dr. Surender Kumar

2. Dr. Dharamveer Sharma

3. Dr. Major Singh Goraya



4. Dr. Navdeep Singh



5. Mr. Sandeep Sharma

6. Mr. Rakesh Kumar

7. Prof. Tajinder Kaur

8. Prof. Paramjit Kaur

9. Prof. Amandeep Kaur

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