

MASTERS OF COMPUTER APPLICATIONS

(LATERAL ENTRY IN 3rd YEAR)

PROGRAMME GUIDE

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INFORMATION

PROGRAMME CODE: 1644

DURATION OF THE PROGRAMME:

Minimum Duration: 1Year

Maximum Duration: 3 Years

MEDIUM OF INSTRUCTION/ EXAMINATION:

Medium of instruction and Examination shall be **English**.

MCA-LE -3rd Year (Master in Computer Applications- Lateral Entry in 3rd Year) Scheme					
COURSE CODE	COURSE TITLE	Cr.	CA	ETE(Th.)	ETE(Pr.)
TERM 5					
DCAP601	SIMULATION AND MODELING	4	20	80	0
DCAP602	NETWORK OPERATING SYSTEMS- I	4	20	60	20
DCAP603	DATAWARE HOUSING AND DATAMINING	4	20	80	0
DCAP604	MODERN WEB PROGRAMMING TOOLS & TECHNIQUES -I	4	20	60	20
DCAP605	ADVANCED DATA STRUCTURE & ALGORITHMS	4	20	60	20
TERM 6					
DCAP606	BUSINESS INTELLIGENCE	4	20	80	0
DCAP607	WIRELESS NETWORKS	4	20	80	0
DCAP608	REAL TIME SYSTEMS	4	20	80	0
DCAP609	CLOUD COMPUTING	4	20	80	0
DCAP802	INDUSTRY PROJECT	4	0	0	100
TOTAL CREDITS		40			

Course Code:	D	C	A	P	6	0	1	Course Title:	SIMULATION AND MODELLING
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WEIGHTAGE	
CA	ETE (Th.)
20	80

COURSE CONTENTS:

Sr. No.	Topics
1.	Introduction: Simulation of a pure-pursuit problem, System and its model, Simulation of an inventory problem, basic nature of simulation, When to simulate
2.	Simulation of Continuous systems: A chemical reactor, numerical integration Vs Continuous system simulation, Selection of integration formulas
3.	Simulation of a servo system, Simulation of water reservoir system, Analog Vs Digital Simulation
4.	Discrete System Simulation: Fixed time-step vs event-to-event model, Simulating randomness, generation of random numbers
5.	Discrete System Simulation: Generation of non-uniformly distributed random numbers, monte-carlo Vs stochastic simulation
6.	Simulation of Queuing Systems: Rudiments of queuing theory, Simulation of single-server queue, Simulation of two-server queue
7.	Simulation of a PERT network: Network model of a project, Analysis of an activity network, Critical path computation, Simulation of an activity network Computer program for simulation, resource allocation and cost considerations
8.	Design and Evaluation of Simulation Experiments: Length of simulation runs, variance reduction techniques, experimental layout, validation
9.	Simulation Languages: Continuous and Discrete system simulation languages, Continuous simulation languages
10.	Simulation Languages: Block-structured continuous simulation languages, Expression-based languages, Discrete-system simulation languages

READINGS: SELF LEARNING MATERIAL.

ADDITIONAL READINGS:

1. "System Simulation using Digital Computers" by Narsingh Deo, PHI.
2. "System Simulation" by G. Gordon, PHI.

Course Code:	D	C	A	P	6	0	2	Course Title:	NETWORK OPERATING SYSTEMS-I
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WEIGHTAGE		
CA	ETE (Pr.)	ETE (Th.)
20	20	60

COURSE CONTENTS:

Sr. No.	Topics
1.	Network Operating System: RedHat Linux, Installing RedHat Linux. Preparing for installation. Booting from CD. Graphical Installation Launch. Setting disk partition levels. Setting Boot Loader, First Boot. Creation of User Account.
2.	RedHat Linux Basics: Working with Desktop. Using Terminal Emulator. File System Hierarchy. Configuring Desktop: working With Desktop Control Center. Understanding Run Levels. Managing Users.
3.	Connecting to Internet: Network Configuration Tool. Connecting to LAN. DNS.
4.	Installing Software: RPM. Meaning, RPM Management Tool. Adding & Removing Packages. Querying RPM Packages.
5.	Shell: Different types of Shells. Common Shell Commands. File System Commands. Environmental Variables.
6.	File System: What is File System. Anatomy of File System. File Permissions and Directories permissions. File Search Utilities.
7.	User Accounts: Super User Vs. Normal User. RedHat User Manager. Creating Groups.
8.	Server Role: Linux as Web Server. Apache Web Server. Installing Apache. Starting Apache. Configuring Web server. Setting up First Web Page.
9.	FTP Server: Meaning, FTP Protocol. Installing vsftpd FTP Server. Starting FTP server. Testing FTP server. Using FTP server. Using FTP Client to Test Anonymous Read Access.
10.	File Server: Overview of Samba Server. Installing SAMBA server. Starting and Stopping the SAMBA server. SAMBA configuration with SWAT. Starting SWAT Service. Adding SAMBA User. Creating and Configuring SAMBA Share.

READINGS: SELF LERNING MATERIAL.

ADDITIONAL READINGS:

1. Title: Beginning RedHat Linux 9 By: Sandip Bhattacharya, Wiley Publications.
2. Red Hat LINUX Unleashed
3. Title: Introduction to Linux, A beginner's guide, Author: Matchel Garless, Fultus Technical library
4. Title: Linux in a nutshell, Author: Ellen Sieve, Aaron Weber, Stephen figgins, O Reilly & Associates
5. Title: Fedora 9 and Red Hat Enterprise Linux Bible, Author: Christopher Negus, Publisher: Wiley

Course Code:	D	C	A	P	6	0	3	Course Title:	DATA WAREHOUSING AND DATA MINING
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WEIGHTAGE	
CA	ETE (Th.)
20	80

COURSE CONTENTS:

Sr. No.	Topics
1.	Data Warehouse Practice: Data warehouse components, Designing the Data Warehouse, Getting Heterogeneous Data into the Warehouse, Getting Multidimensional Data out of the Warehouse.
2.	Data Warehouse Research-Issues and Research: Data Extraction and Reconciliation, Data Aggregation and Customization, Query Optimization, Update Propagation, Modelling and Measuring Data Warehouse Quality, Some Major Research Projects in Data Warehousing, Three Perspectives of Data Warehouse Metadata..
3.	Source Integration: The Practice of Source Integration, Research in Source Integration, Towards Systematic Methodologies for Source Integration.
4.	Data Warehouse Refreshment: Data Warehouse Refreshment, Incremental Data Extraction, Data Cleaning,
5.	Data Warehouse Refreshment: Update Propagation into Materialized Views, Towards a Quality-Oriented Refreshment Process, Implementation of the Approach
6.	Multidimensional Data Models and Aggregation: Multidimensional View of Information, ROLAP Data Model, MOLAP Data Model, Logical Models for Multidimensional Information, Conceptual Models for Multidimensional Information
7.	Query Processing and Optimization: Description and Requirements for Data Warehouse Queries, Query Processing Techniques.
8.	Metadata and Warehouse Quality: Metadata Management in Data Warehouse Practice, A repository Model for the DWQ Framework, Defining Data Warehouse Quality.
9.	Metadata and Data Warehouse Quality: Representing and Analyzing Data Warehouse Quality, Quality Analysis in Data Staging.
10.	Quality-Driven Data Warehouse Design: Interactions between Quality Factors and DW Tasks, The DWQ Data Warehouse Design Methodology, Optimizing the Materialization of DW Views

READINGS: SELF LEARNING MATERIAL.

ADDITIONAL READINGS:

1. Title: Fundamentals of Data Warehouses, Author: Matthias Jarke, Maurizio Lenzerini, Yannis Vassiliou, Panos Vassiliadis, Publisher: Springer
2. Alex Berson, Data Warehousing, Data Mining, and OLAP, Tata Mcgraw Hill, 1997
3. George M Marakas, Modern Data Warehousing, Mining & Visualization Core Concepts, Pearson Education, 2002
4. Data Mining: Modelling Data for Marketing, Risk and Customer Relationship Mgmt, Author: Rud, olivia, Publisher: Wiley, 2000
5. Data Mining Techniques by Berry, Michael
6. Data Mining, Data Warehousing and OLAP by Sharma, Gajaandra
7. Data Mining with Case Studies by Gupta GK
8. Principles of Data Mining by Hand, David.

Course Code:	D	C	A	P	6	0	4	Course Title:	MODERN WEB PROGRAMMING TOOLS & TECHNIQUES - I
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WEIGHTAGE		
CA	ETE (Pr.)	ETE (Th.)
20	20	60

COURSE CONTENTS:

Sr. No.	Topics
1.	The .Net Framework: HTML and HTML forms, Server side programming, client programming, Common language runtime, .Net Class library
2.	Visual Studio: Creating Websites, Designing a webpage, The anatomy of a Web Form, Writing Code, Visual Studio Debugging.
3.	Web Form Fundamentals: ASP.NET application, Introducing Server Controls, HTML control classes, The Page Class, Application events, ASP.NET configuration.
4.	Web Controls: Web Control Classes, List Controls, Web Control Events and AutoPostBack, A simple Web Page
5.	State Management: View State, Transferring Information Between Pages, Cookies, Session State, Session State Configuration, Application State.
6.	Error Handling Logging and Tracing: Common errors, Handling Exceptions, Throwing your own Exceptions, Logging Exceptions, Error Pages, Page Tracing.
7.	Validation: Understanding Validation, The validation controls Rich Controls: The calendar, AdRotator, Pages with Multiple view, User Controls and Graphics: User Controls, Dynamic Graphics
8.	Styles, Themes and Master Pages: Styles, Themes, Master Page Basics.
9.	ADO.NET and Data Binding: Configuring your Database, ADO.NET basics, Direct Data Access. Single Value data binding, Repeated Value Data Binding.
10.	Website Security: ASP.NET security Model, Forms Authentication, Windows Authentication. Deploying Web Site: How to deploy the web site. On local IIS or remote IIS.

READINGS: SELF LEARNING MATERIAL.

ADDITIONAL READINGS:

1. Author: Beginning ASP.NET 3.5: In VB 2008 By: Matthew MacDonald, Apress Second Edition
2. Professional ASP.NET 3.5 in C# and VB, Bill Evjen Wiley Publications, 2008.
3. ASP.NET 3.5 Unleashed Stephen Walther, Pearson Education.

Course Code:	D	C	A	P	6	0	5	Course Title:	ADVANCED DATA STRUCTURE & ALGORITHMS
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WEIGHTAGE		
CA	ETE (Pr.)	ETE (Th.)
20	20	60

COURSE CONTENTS:

Sr. No.	Topics
1.	List: Abstract data types, list adts: array implementation, linked list ,common errors, doubly linked list, circularly linked list, cursor implementation of linked list.
2.	Stack: Stack model, implementation of stacks, applications; queues: queue model, array implementation, applications.
3.	Trees: Binary trees, binary search trees, avl trees.
4.	Splay trees, b-trees.
5.	Hashing: Hash functions, open hashing, closed hashing, rehashing.
6.	Heaps: Binary heaps, applications, d-heaps.
7.	Leftist heaps, skew heaps, binomial queues
8.	Sorting: insertion sort, shell sort, heap sort
9.	Merge sort, quick sort, bucket sort, external sort
10	Graphs: Shortest path algorithms, network flow problem, minimum spanning tree

READINGS: SELF LEARNING MATERIAL.

ADDITIONAL READINGS:

1. Mark Allen Weiss: Data Structure & Algorithm Analysis in C SECOND EDITION: Addison –Wesley publishing
2. Thomas H. Cormen, Charles E. Leiserson & Ronald L. Rivest: Introduction to Algorithms. Prentice- Hall of India Pvt. Limited, New Delhi
3. Kruse, Data Structures & Program design, Prentice Hall of India, New Delhi.
4. Taenenbaum, Augenstein, & Langsam, Data Structures using C and C++, Prentice Hall of India, New Delhi.
5. Sorenson and Tremblay: An Introduction to Data Structures with Algorithms.
6. Author: Seymour Lipschutz, Title: Schaum Outline Series, Publishers: Tata McGraw Hill, New Delhi, Year of Publication: 2006

Course Code:	D	C	A	P	6	0	6	Course Title:	BUSINESS INTELLIGENCE
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WEIGHTAGE	
CA	ETE(Th.)
20	80

COURSE CONTENTS:

S. No.	Topics
1.	Business Intelligence: Introduction, Meaning, Purpose and Structure of Business Intelligence Systems. Understanding Multidimensional Analysis Concepts: Attributes, Hierarchies and Dimensions in data Analysis. Understanding Dimensional Data warehouse: Fact Table, Dimension Tables, Surrogate Keys and alternative Table Structure. What is multi dimension OLAP?
2.	Understanding OLAP: Fast response, Meta-data based queries, Spread sheet formulas. Understanding Analysis Services speed and meta data. Microsoft's Business intelligence Platform. Analysis Services Tools. Data Extraction, Transformation and Load. Meaning and Tools for the same.
3.	Creating your first Business Intelligence Project. Creating Data source, Creating Data view. Modifying the Data view. Creating Dimensions, Time, and Modifying dimensions. Parent-Child Dimension.
4.	Creating Cube: Wizard to Create Cube. Preview of Cube. Adding measure and measure groups to a cube. Calculated members. Deploying and Browsing a Cube.
5.	Advanced Measures and Calculations: Aggregate Functions. Using MDX to retrieve values from cube. Calculation Scripting. Creation of KPI's.
6.	Advanced Dimension Design: Creating reference, fact and many to many dimensions. Using Financial Analysis Cubes. Interacting with a cube. Creating Standard and Drill Down Actions.
7.	Retrieving data from Analysis Services: Creating Perspectives, MDX Queries, Excel with Analysis Services.
8.	Data mining: Meaning and purpose. Creating data for data mining. Data mining model creation. Selecting data mining algorithm. Understanding data mining tools. Mapping Mining Structure to Source Data columns. Using Cube Sources. Configuring Algorithm parameters.
9.	Creating Data mining queries and reports. Creation of Prediction queries. Understanding DMX language.
10.	Reporting Tools: Using SQL Server Reporting Services to develop reports for analysis services.

READINGS: SELF LEARNING MATERIAL

ADDITIONAL READINGS:

1. "Microsoft SQL Server 2008 Analysis Services", Scott Cameron. Microsoft Press. (2009)
2. "SQL Server 2008 Business Intelligence Development and Maintenance", Erric Veerman. Microsoft Press (For Data Mining only)
3. Business intelligence a managerial approach. Turban E, Sharda R, Aronson J.E. and King D.(2007). Prentice Hall
4. Mike Biere, Business Intelligence for the Enterprises, Prentice Hall, 2003.
5. Larissa T. Moss and Shaku Atre, Business Intelligence Roadmap: The complete Project Lifecycle for decision support Application, Addison-Wessly 2003.
6. Decision support and Data Warehousing systems Mallach E.G(2000). McGraw Hill.

Course Code:	D	C	A	P	6	0	7	Course Title:	WIRELESS NETWORKS
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WEIGHTAGE	
CA	ETE(Th.)
20	80

COURSE CONTENTS:

S. No.	Topics
1.	Introduction to Wireless Networks. IEEE Standards for Wireless Networks. Wireless Networks Applications. Types of Wireless Networks. Benefits of Wireless Networks.
2.	Wireless System Architecture: Wireless System Components, Network Architecture. Information Signals. Radio Frequency and Light Signal Fundamentals: Wireless Transceivers, understanding RF Signals, Working of Light Signals, Modulation: Sending Data packets in the Air.
3.	Types of Wireless Networks: WPAN, WLAN, WMAN Wireless PAN: Components: User Devices, Radio NIC, USB Adapters, Wireless Routers, Bluetooth Dongles etc. Wireless PAN Systems: SOHO Equipments, Printing, Accessing Internet, Accessing PDA's, Mobile Phones Wireless PAN Technologies: IEEE 802.15. Bluetooth Version 1 and Version 2.
4.	Wireless LAN: Meaning, Components: User Devices, Radio NIC's, Access Points, Routers, Repeaters, And Antennae. SOHO Applications: Internet Access, Printing, Remote Accessing. Public Wireless LAN's, and AdHoc Wireless LAN's
5.	Wireless MAN: Meaning and Components: Bridges, Bridges Vs. Access Points, Ethernet to Wireless Bridges, Workgroup Bridges, Directional Antennae's, Semi-Directional, Polarization.
6.	Wireless MAN Systems: Point to Point Systems, Point to Multi Point, Packet Radio Systems. Wireless MAN Technologies: IEEE 802.11 and Wi-Fi and also purpose of IEEE 802.16 Standard
7.	Wireless WAN: WAN User Devices, Base Stations, Antennae. Wireless WAN Systems: Cellular-Based Wireless WANs, First-Generation Cellular, Second-Generation Cellular, Third-Generation Cellular, SMS Application.
8.	Space-Based Wireless WANs: Satellites, Meteor Burst Communications
9.	Wireless Networks Security: Security Threats, Traffic Monitoring, Unauthorized Access, Middle Attacks, DoS Attack (Denial of Service). Protective Actions: WEP, WEP issues, WPA, VPN.
10.	Authentication. 802.11 Authentication Vulnerabilities, MAC Filters, Authentication Using Public Key Cryptography, 802.1x, Security Policies.

READINGS: SELF LEARNING MATERIAL.

ADDITIONAL READINGS:

1. Wireless Networks First Step, By: Jim Geier, CISCO Press.
2. Principles of Wireless Networks by Kaveh Pahlavan, Pearson Education.
3. Wireless Communication & Networks by William Stallings, Pearson Education.
4. 802.11 Wireless Networks: The definitive Guide by Mathew Gaust, o'Reilly.
5. Building Wireless Community Network by Fringer, o'Reilly.

Course Code:	D	C	A	P	6	0	8	Course Title:	REAL TIME SYSTEMS
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WEIGHTAGE	
CA	ETE(Th.)
20	80

COURSE CONTENTS:

S. No.	Topics
1.	Introduction to real time Applications: Digital Control, High Levels Control, Signal Processing, Other Real Time Applications.
2.	Hard Versus Soft Real-Time System: Jobs and Processors, Release Time, Deadline and Timing constraints, Hard and Soft Timing constraints, Hard real time systems, Soft real time systems.
3.	A Reference Model of Real Time System: Processors and Resources, Temporal Parameters of real time model, Precedence constraints and data dependencies.
4.	Other Types of dependences, Functional parameters, Resource parameters of jobs and parameters of resources, scheduling hierarchy.
5.	Commonly used Approaches to Real Time Scheduling: Clock-Driven approach, Weight Round-Robin Approach, Priority-Driven Approach, Dynamic versus Static system, Effective Release Times and Deadlines.
6.	Commonly used Approaches to Real Time Scheduling: Optimality of the EDF and LST Algorithm, Nonoptimality of the EDF and the LST Algorithm, Challenges in validating Timing Constraints in Priority-Driven System, Off-Line versus On –Line Scheduling.
7.	Clock-Driven Scheduling: Notations and Assumptions, Static, Timer-Driven Scheduler, General Structure of Cyclic Scheduler, Cyclic Scheduling.
8.	Clock-Driven Scheduling: Improving the Average Response Time of Aperiodic jobs, Scheduling Sporadic Jobs, Practical Consideration and Generalizations, Algorithm for Constructing Static Schedules, Pros and Cons of Clock Driven Scheduling.
9.	Priority Driven Scheduling of Periodic Tasks: Static Assumptions, Fixed Priority versus Dynamic Priority Algorithms, Maximum Schedulable Utilization, Optimality of the RM and DM Algorithms, A Schedulability Test for Fixed-Priority Tasks with Short Response Time.
10.	Priority Driven Scheduling of Periodic Tasks: Schedulability Test for Fixed--Priority Tasks with Arbitrary Response Time, Sufficient Schedulability conditions for the RM and DM Algorithm, Practical Factors

READINGS: SELF LEARNING MATERIAL.

ADDITIONAL READINGS:

1. Jane W.S.Liu, Real Time System, Pearson Education, 2008.
2. Alan, C. Shaw, RTS and software, John Wiley and Sons, New York, 2001.
3. Philip Laplante, Real-time systems design and analysis, an engineer's handbook, IEEE Computer Society Press, New York.
4. J.E. Cooling, Software Design for Real-time Systems, Chapman and Hall, New York.
5. Hassan Gomaa, Software Design Methods for Concurrent and Real-time Systems, Addison-Wesley, Massachusetts.

Course Code:	D	C	A	P	6	0	9	Course Title:	CLOUD COMPUTING
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WEIGHTAGE	
CA	ETE(Th.)
20	80

COURSE CONTENTS:

S. No.	Topics
1.	Understanding Cloud Computing: Cloud Computing, History of Cloud Computing, Cloud Architecture, Cloud Storage, Why Cloud Computing Matters
2.	Understanding Cloud Computing: Advantages of Cloud Computing , Disadvantages of Cloud Computing, Companies in the Cloud Today, Cloud Services
3.	Developing Cloud Services: Web-Based Application, Pros and Cons of Cloud Service Development, Types of Cloud Service Development, Software as a Service, Platform as a Service.
4.	Developing Cloud Services: Web Services, On-Demand Computing, Discovering Cloud Services Development Services and Tools, Amazon Ec2, Google App Engine, IBM Clouds
5.	Cloud Computing for Everyone: Centralizing Email Communications, Collaborating on Schedules, Collaborating on To-Do Lists, Collaborating Contact Lists, Cloud Computing for the Community, Collaborating on Group Projects and Events, Cloud Computing for the Corporation
6.	Using Cloud Services: Collaborating on Calendars, Schedules and Task Management, Exploring Online Scheduling Applications, Exploring Online Planning and Task Management,
7.	Using Cloud Services: Collaborating on Event Management, Collaborating on Contact Management, Collaborating on Project Management, Collaborating on Word Processing, Collaborating on Databases, Storing and Sharing Files
8.	Other ways to collaborate Online: Collaborating via Web-Based Communication Tools, Evaluating Web Mail Services, Evaluating Web Conference Tools, Collaborating via Social Networks and Groupware, Collaborating via Blogs and Wikis

READINGS: SELF LEARNING MATERIAL

ADDITIONAL READINGS:

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.
2. Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008.