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Additional Options for Lateral Entry students:

There is a provision for MCA lateral entry students who have already undergone the courses existing in MCA curriculum (subject to their proficiency) in their undergraduate programme to choose the different courses listed below:

- MC15L01 Master Data Management
- MC15L02 Information Security Management
- MC15L03 Business Intelligence System
- MC15L04 Software Project Management
- MC15L05 E-Business Technology and Management
- MC15L06 Distributed Databases
- MC15L07 Wireless Application Protocols
- MC15L08 AI and Expert Systems
- MC15L09 Knowledge Management
- MC15L10 Software Process Maturity Models
- MC15L11 Human Computer Interactions
- MC15L12 Open Elective

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MC15L01	MASTER DATA MANAGEMENT

COURSE RATIONALE:

This course on "Master Data Management" deals with top technology trends in the area of information Management. This is focused on new ways of structuring, choosing, understanding, integrating and disseminating information that is needed to run a business.

COURSE OBJECTIVES:

At the end of the course, the student will equip themselves with the following concepts in Master Data Management and Data Governance.

1. Overview of Master Data Management
2. Market Drivers
3. Industry application of MDM
4. Components of MDM
5. Architecture of MDM
6. Security and identity Management
7. MDM vendors

Introduction to Master Data Management - Market Drivers and key challenges – MDM Applications by industry

Architectural Considerations - Architecture classifications, concepts, principles and components - Data Management concerns – Entities – Hierarchies and Meta Data – MDM Services for entity and relationships resolution and hierarchy management – Master Data Modeling

Risk management for Master Data – Information security and Identity Management – Content protection Methods and tools – Enterprise security and Data visibility in MDM Environments

Project initiation – Entity Resolution Identification, Matching, Aggregation and Holistic view of the master objects – Data Synchronisation – Master data governance

MDM vendors and Products Landscape – MDM Guiding principles – MDM Market Trends and Directions

REFERENCE

1. Alex Berson Larry Dubov, "Master Data Management and Governance", Tata McGraw Hill Education Pvt, New Delhi, Edition 2011

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MC15L02	INFORMATION SECURITY MANAGEMENT

COURSE RATIONALE:

This subject on "Information Security Management "covers the Business needs of information security, the legal, ethical & professional issues and the methods to provide security.

COURSE OBJECTIVES:

At the end of the course, the student will equip themselves with the following concepts and issues in information security Management

1. Need for security
2. Legal, Ethical and Professional issues in Information security
3. Risk Management
4. Planning for security and Security Technology
5. Information security maintenance

Introduction to Information Security – critical characteristics of information – information system components – balancing information security and access – security system development life cycle - Business needs of security – Security professionals and organization

Business need of security – threats – attacks: malicious code, back doors, password crack, spoofing, man-in-the-middle, spam, sniffers, timing attack - Risk Management – risk identification – risk assessment – risk control strategies – selecting a risk control strategies – quantitative and qualitative risk control practices

Information security policy – EISP – ISSP – SysSP – ISO27000 series – NIST security model – IETF security model – Security education – Security training – Security awareness – Business impact analysis – Incident response planning – Disaster recovery planning – Business continuity planning

VPNs – Intrusion Detection – Access control – cryptography - Physical security – Implementation – Maintenance – ISO network management model – Monitoring external and internal – Planning and risk assessment

Law and ethics in information security – Relevant Indian laws – International laws and legal bodies – Ethical differences across culture – misuse of corporate resources – Codes of ethics and professional organization - Legal, ethical and Professional issues

REFERENCES

1. Dr. Micheal E.Whitman, Herbert J. Mattord,*"Principles and Practices of Information Security"*Cengage Learning Fourth Indian Reprint, 2010.
2. Charles P, Pfleeger, Shari Lawrence Pfleeger, *"Security in computing",* Pearson, Fifth Impression, 2011.
3. Michael T. Simpson, *"Ethical Hacking and Network Defense"*, course technology, Language Learning, 2009.
4. Rajneesh Agarwal, Bharat Bhushan Tiwari, *"Data Communication and Computer Networks*", VIKAS Publishing House Pvt Ltd, 2009.
5. William Stallings, *"Network Security Essentials: Applications and Standards",* Pearson Education, Second Impression, 2009.

MC15L03	BUSINESS INTELLIGENCE SYSTEM

COURSERATIONALE:

The purpose of learning this course on "Business Intelligence System" is to provide an introduction to the field of Business Intelligence, which has been defined as the extensive use of data, statistical and quantitative analysis, exploratory and predictive models, and fact-based management to drive decisions and actions. The development and use of data warehouses and data marts to support business analytics is discussed. The use of key performance indicators, dashboards and scorecards for performance management and opportunity assessment are addressed. Text and web mining are discussed, and the application of selected data mining techniques to business decision making situations is illustrated. Students actively participate in the delivery of this course through case and project presentations.

COURSE OBJECTIVES:

At the end of this course on Business Intelligence System, the learner will be able to:

1. Gain an understanding of how managers use business analytics to formulate and solve business problems and to support managerial decision making.
2. Become familiar with the processes needed to develop, report, and analyze business data.
3. To learn how to use and apply selected business analytics software

Overview of Business Intelligence Systems - components of Business Intelligence-data warehousing- data mining-how is business intelligence different from information, algorithms, mind-set required for a business analytics profession

Concepts of data warehousing – Data Warehouse Architecture - applications. E-T-L (Extract, Transform, Load) concepts - Difference between data ware housing and data mining

Data Mining – OLAP analysis - algorithms for data mining, classification and prediction, discriminant analysis, classification and regression trees, and cluster analysis

Decision Support system, Neural Networks, Web mining and text mining

Applications of Business Intelligence
Practice sessions: Analysis of Data, Data mining using SPSS

REFERENCES

1. Krzysztof J. Cios, Witold Pedrycz, Roman W. Swiniarski, *"Data mining: a knowledge discovery approach"*,Springer, 2007.
2. Hand D. J., Heikki Mannila, Padhraic Smyth,*"Principles of data mining"*MIT Press, 2001.
3. Soumen Chakrabarti, Earl Cox, Ian H. Witten, Morgan Kaufmann,*"Data mining: know it all"*,2008.
4. Mehmed Kantardzic,*"Data Mining: Concepts, Models, Methods, and Algorithms"*,Wiley-IEEE, 2011
5. Tsau Young Lin, Ying Xie, Anita Wasilewska, "*Data mining: foundations and practice"*,Springer, 2008.
6. Efraim Turban, Ramesh Sharda, Dursun Delen, David King, Janine E. Aronson,*"Business , 10.Intelligence: A Managerial Approach"*,Pearson Education Canada, 2010.
7. Mike Biere,*"Business intelligence for the enterprise"*, Prentice Hall Professional, 2003.

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MC15L04	SOFTWARE PROJECT MANAGEMENT

COURSERATIONALE:

The purpose of learning this course on "Software Project Management" is to provide an introduction to the field of Software Project Management, which is by far the most important factor in software project execution. The course begins with the introduction to the definition of Software projects along with their types and covers the project planning stage in SPM, different metrics used, processes for control and monitoring, and configuration management. The concepts of RFP and CMMI frameworks are also included so that the different process areas required for project management activities could be understood. General concepts of risk management is included to understand risk identification, risk mitigation and risk management. Students actively participate in the delivery of this course through case and project presentations.

COURSE OBJECTIVES:

At the end of this course on Software Project Management, the learner will be able to:

1. Understand how SPM is important in the execution of software projects
2. Gain useful insight into the intricacies involved in Software Project Management
3. Appreciate the need for SPM to be systematic and at the same time meet the goals of the project and customer requirements.

Understanding software projects – Project management vs. product management – stages of project management – Software project life cycle - Managerial issues.

Project initiation – Identifying project – Developing project character – Identifying stack holders – Requirement analysis – Gathering requirements – Requirements types – Project scope planning – Resource breakdown structure (RBS) – Manpower planning – Quality planning – Time and Cost estimates – Risk management planning – Procurements for the project

Software effort estimation techniques: KLOC/SLOC estimation, expert opinion, top-down and bottom-up approach, use-case point estimates, object point estimates, Delphi technique – Project test plan – Software quality assurance (SQA) – Software quality control (SQC) – cost of quality – Software quality Metrics – SEI-CMMi model

Understanding Project risk management process – risk management planning – identification of risks – risk analysis – risk-response planning – Monitoring the risks – Role of project manager – Leadership styles – recruitment process – team development stages – Conflict management in Project environment – Hiring and firing issues in software project management – Communication process

Project scheduling – Activity diagrams – Network diagrams – PERT & CPM for Schedule development – Schedule compression technique – Critical chain method – Software project scheduling tools – Program - Project-Program-Portfolio relationships - Project portfolio – Project Management Careers

REFERENCES

1. Sanjay Mohapatra, *"Software Project Management",* Cengage Learning, 2011.
2. Sudhakar GP,*"Elements of Software Project Management"*, PHI 2010.
3. SA Kelkar, *"Software Project Management : A concise study"*, PHI 2009.
4. Joel Henry,*"Software Project Management: A real world guide to success",* Pearson,2011.
5. Kathy Schwalbe,*"Project Management in IT"*, Cengage Learning, 2011
6. Kassem A Saleh, *"Software Engineering",* Cengage Learning, 2010

MC15L05	E-BUSINESS TECHNOLOGY AND MANAGEMENT

COURSE RATIONALE:

The purpose of learning this course on E-Business Technology and Management is to identify several considerations that affect the choice of IT applications, IT platforms, data access policies, and systems development methods in the present scenario.

COURSE OBJECTIVES:

At the end of this course on E-Business Technology and Management, the learner will be able to learn the following.

1. Advantages of conducting business online.
2. How to use the web to market products worldwide at a nominal price.
3. Understand the Web Advertising techniques for improving the Profitability.
4. Identify the need for the firm to have a competitive strategy.
5. Experience the Readily available customer service in encouraging the customer to know more about the product or service.

Introduction to Internet – E Business - The Second Wave of global E-Business – Business models – Revenue models – Business processes – E-Commerce opportunities – B2B, B2C, C2C business models

E-Business Technology Basics – Internet protocols - TCP/IP – Domain names – Electronic mail protocol – Marking-up languages in WWW – Intranets and Extranets – XML - Web Server and E-mail Technologies – Web server basics

E-Business revenue models – Effective Web presence - Selling to Consumers Online-Selling to Businesses Online – Functions of EDI – Internet and Supply chain Management – Electronic Market place

Introduction to M-Commerce – Online auction - Virtual Communities - Online Security – Security for Client computers – Communication channel security – Threats to online users – CERT - Online Payment Systems – Payment gateway – Electronic wallets – E-Cash

Internet technologies and Banking Industry – Retail business in internet – Strategies for developing E-Commerce website – Social media and e-business – Staffing and Career options for E-Commerce

REFERENCES

1. Gary P. Schneider,*"E-Commerce – Strategy, Technology and Implementation"*-2011 Course Technology-First India Edition, 2012.
2. Jibitesh Mishra,*"E-Commerce",*Macmillan publishers India Ltd,2011.
3. Paul Phillips,E-Business *"Strategy,Text and Cases",*Tata McGraw-Hill , Edition, 2011.
4. Elias.M.Awad,*"Electronic Commerce",*Pearson education,3rd edition,
5. Ward A.Hanson,Kirthi Kalyanam,*"E-Commerce & Web marketing,* Cengage learning, 2009.

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Subject Code	Title of the Subject
MC15L06	DISTRIBUTED DATABASES

Instructional Objectives:

- To describe the basic concepts of Distributed Database and
- To describe how the transactions made in Distributed Environment
- To explore the Performance of Parallel Database Systems
- To explain Transaction Management and its Models

Introduction - Distributed database Architecture - Architectural models

What is Distributed Database System – DBMS Standardization – Autonomy – Distribution – Heterogeneity – Architectural Alternatives - DDBMS Architecture – Client / Server Systems – Peer to Peer distributed Systems – MDBS Architecture - Fragmentation – Fragmentation Alternatives

Distributed query processing and query optimization

Query Processing Problem – Objectives of Query Processing – Characterization of query processors – Layers of query processing – Query optimization – Centralized query optimization algorithms – INGRES Algorithm – System R Algorithm – Distributed INGRES Algorithm – R* Algorithm – SDD-1 Algorithm

Distributed transaction management and concurrency control algorithms

Transaction – Properties of Transactions – Types of Transaction - Distributed Execution Monitor – Serializability – Classifications of Concurrency Control mechanisms – Locking based Concurrency control algorithms – Timestamp based concurrency control algorithms – Optimistic & Relaxed Concurrency Control - Deadlock Management

Reliability and high performance database- Parallel database Systems

Reliability Concepts and measures – Failure and fault tolerance in distributed systems – Failures in distributed DBMS – Local reliability protocols – Distributed reliability protocols – Dealing with site failures – Network Partitioning – Database servers – Parallel Architecture – Parallel DBMS Techniques – Data Placement & Query Parallelism – Parallel Execution Problems

Object distribution design, query processing, Transaction management

Fundamental Object concepts and models – Object distribution design – Architectural issues – Object Management – Distributed Object Storage – Object Query Processor Architecture – Transaction Management – Transaction models and object structure – Transaction management in ODBMSs – Transactions as objects

Text Book:

1. M.Tamer Ozsu, Patrick Valduriez (2006), **Principles of Distributed Database System,** Pearson Education, New Delhi (For 1 to 5 units).

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Reference Book:

1. Elmashri & Navathe (2000), **Fundamentals of Database System,** Addison-Wesley Publishing, 3rd Edition, New York.
2. Stepanoceri, Giuseppe Pelagati (1984), **Distributed Database Principles & Systems,** McGraw Hill, New Delhi.

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Subject Code	Title of the Subject
MC15L07	WIRELESS APPLICATION PROTOCOLS

Instructional Objectives:

- To impart knowledge on Wireless Technology, WML Script functions, Wireless Application Protocol and its application areas.
- To enable the learner for aspiring careers in WAP related specialized software field.

Mobile Internet Standard

Key services: Productivity Applications – Information and transactional services – Life Enhancing management – Characteristics of the mobile Internet – Current web Technologies – Origins of WAP – WAP architecture – Components of WAP standard – Network Infrastructure services – Design principle – other standards.

WML

Introduction to WML – Document model – WML Authoring – URL Identify – Markup Basics – Basic content – Events , tasks & Bindings – Variables – Images, tables and links - controls – miscellaneous markup – Application security.

WML Script and WTAI

WML Script overview – Language Basics : Variables – operators – statements – Functions – Pragmas – standard libraries – WTAI overview – WML Script development – Binary WML script.

User Interface Design

Web site design – structure usability methods – design guidelines – selected WML elements – navigation and user input – Appearance and presentation – standard HTTP Header – CC/PP document – End to End communication – profile composition.

Push Messaging and WTA

Push messaging: overview – Access protocol – Addressing – MIME media types – Proxy gateway – WTA: Architecture – Client Framework – WTA server and security – Design consideration – Application creation.

Text Book:

1. Singhal .S,Bridgman.T, Suryanarayana.L, Mauney.D, Alvinen.J, Bevis.D, Chan.J, Hild.S (2011), **WAP-The Wireless Application Protocol,** Pearson publications, New Delhi (For 1 to 5 units).

Reference Book:

1. Steve Mann & Scott Sbihli (20000), **Wireless Application Protocols,** Wiley Computer Publishing, New York.

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Subject Code	Title of the Subject
MC15L08	AI AND EXPERT SYSTEMS

Instructional Objectives:

- To impart knowledge on Artificial Knowledge concepts
- To learn all searching algorithms and Hill-climbing procedures
- To improve their gaming skills and learn about Expert system
- To enable the learners for aspiring careers in the field of Artificial Intelligence.

Introduction to AI & AI Techniques : Introduction to types of knowledge - Ai Techniques and Production system - Control strategies - Breadth-First Algorithm - Depth-First Algorithm - Heuristic Search - Problem characteristics and production system characteristics - Best-first Search.

Knowledge Representation Using Predicate Logic : Knowledge Representations – Mappings - Approaches to knowledge representations – simple and Inheritable - Approaches to knowledge representations –Inferential & Procedural knowledge - Predicate logics – symbols and rules - Sample examples on predicates logics - Representing simple facts in logic - Representing knowledge using rules – PROLOG - Forward and Backward reasoning - Truth Maintenance System - Statistical reasoning - Bayesian Networks

Weak – and – Strong Slot Filler Structures : Weak – slot – filler structure - Semantic nets – intersection search - Making some important distinctions on semantic nets - Partitioned semantic net - Partitioned semantic net - Creating Frames - Strong-slot-filler structures – conceptual dependencies - Actions and Rules – CD - Scripts introduction and components - Creating a sample script for RESTAURANT - CYC & CYC

Game Playing & Planning : Game playing techniques – The Minimax Search Procedure -Iterative deepening - Depth first iterative deepening - How to plan a system –Components of a planning System – Goal Stack Planning -Hierarchical planning - Reactive systems – Understanding -

Learning &Expert Systems : Types of learning - General learning models - Expert system components and descriptions - Expert system shells - Types Explanation - Knowledge Acquisition - issues

Text Books:

1. Elaine Rich, Kevin Knight, Shivashankar B Nair (2009) – **Artificial Intelligence** – Third Edition-TataMcGraw Hill, New Delhi (For 1 to 5 units).

Reference Books:

1. Patterson W Dan (2009, 2013), **Introduction to Artificial Intelligence and Expert system** – Prentice Hall of India, New Delhi.
2. Peter Jackson (1999), **Introduction to Expert systems** – 3rd Edition – Addison-Wesley, New York.

Subject Code	Title of the Subject
MC15L09	Knowledge Management

PURPOSE

- The purpose of this course is to produce highly competent knowledge professionals.
- It equips students to make a broader and more effective contribution in developing Knowledge Management systems.
- This helps us to produce leaders, critical thinkers and technopreneurs in IT for the knowledge economy.

INSTRUCTIONAL OBJECTIVE

- Design and develop knowledge-based information systems for knowledge representation, management, and discovery.
- Explain how knowledge has caused changes in industries, markets and organisations.
- Developed an understanding of some of the key themes that have arisen in relation to artificial intelligence and expert systems.
- Understand several theoretical approaches to conceptualising knowledge management and information technology.
- Have developed critical insights into the opportunities and challenges that information systems present to knowledge management initiatives in specific contexts.

Introduction: An Introduction to Knowledge Management - The foundations of knowledge management- including cultural issues- technology applications- organizational concepts and processes- management aspects- and decision support systems. The Evolution of Knowledge management: From Information Management to Knowledge Management - Key Challenges Facing the Evolution of Knowledge Management - Ethics for Knowledge Management.

CREATING THE CULTURE OF LEARNING AND KNOWLEDGE SHARING : Organization and Knowledge Management - Building the Learning Organization. Knowledge Markets: Cooperation among Distributed Technical Specialists - Tacit Knowledge and Quality Assurance.

KNOWLEDGE MANAGEMENT-THE TOOLS : Telecommunications and Networks in Knowledge Management - Internet Search Engines and Knowledge Management - Information Technology in Support of Knowledge Management - Knowledge Management and Vocabulary Control - Information Mapping in Information Retrieval - Information Coding in the Internet Environment - Repackaging Information.

KNOWLEDGEMANAGEMENT-APPLICATION :Components of a Knowledge Strategy - Case Studies (From Library to Knowledge Center Knowledge Management in the Health Sciences, Knowledge Management in Developing Countries).

FUTURE TRENDS AND CASE STUDIES : Advanced topics and case studies in knowledge management - Development of a knowledge management map/plan that is integrated with an organization's strategic and business plan - A case study on Corporate Memories for supporting various aspects in the process life -cycles of an organization.

TEXT BOOKS

1. Srikantaiah, T.K., Koenig, M., Knowledge Management for the Information Professional, Information Today, 2008

2. Nonaka, I., Takeuchi, H., The Knowledge-Creating Company: How Japanese companies create the dynamics of innovation,1995

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Subject Code	Title of the Subject
MC15L10	Software Process Maturity Models

INTRODUCTION : Software Process - Software Maturity Framework – Software process Improvement – Process Maturity levels – Principles of Software process Change – Software Process Assessment.

CMM : Introduction – CMM Maturity Levels - Initial process- Repeatable Process – Defined Process – Managed Process – Optimizing Process.

CMMI Evolution of CMMI – CMMI Framework – CMMI for Development – Capability level – Maturity levels – Case Study.

TMM Introduction to TMM – Structure of the TMM – Components of TMMi – Generic Goals and Generic Practices – Process areas for Generic practices - TMMi Maturity Levels – Initial – Managed – Defined – Management and Measurement – Optimization.

AGILE MATURITY MODEL Agile Software Development – Process Improvement framework for Agile Software Development – Intial Level – Explored Level – Defined level – Improved Level – Sustained Level - Software Process Improvement for Agile Software Development Practices.

TEXT BOOKS

1. Watts S. Humphrey, “Managing the Software process”, Pearson education, 2008.

2. Marry Beth Chrissis, Mike Konnard, Sandy Shrum, “CMMI : guidelines for Process Integration and Product Improvement”, Addison Wesley, 3rd Edition, 2011.

REFERENCES Mark. C. Paulk, “CMM:Guidelines for Improving the Software Process”, 2011.

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Subject Code	Title of the Subject
MC15L11	Human Computer Interaction

BASICS OF HUMAN COMPUTER INTERACTION Human Input-output channels and memory of the human--Psychology and design of the interaction model-computer input and output channels—models of interaction-- Frameworks & HCI—Industrial interface—Interaction styles—WIMP interfaces—interactivity

SOFTWARE PROCESS & DESIGN RULES Interaction design basics – the process of design, user focus, navigation design, screen design & layout; HCI in software process –software life cycle, Usability engineering, Interactive design & prototyping; Design rules – Principles to support usability, standards, guidelines

IMPLEMENTATION SUPPORT, EVALUATION TECHNIQUES AND USER SUPPORT Implementation support – Windowing system elements, using tool kits. User interface management; Evaluation techniques – goals, expert analysis, user participation, choosing a method; User support – requirements, approaches, adaptive help systems

HUMAN COMPUTER INTERACTION MODELS Cognitive models – Goal & task hierarchies – Linguistic models – Physical & device models – cognitive architectures Communication & collaboration models – Face-to-face communication, conversation ,text based communication and group working; Task analysis – task decomposition, Knowledge based analysis, ER based techniques

UBIQUITOUS COMPUTING AND WEB TECHNOLOGY Ubiquitous computing—Defining ubiquitous computing , features of ubiquitous computing , application research, virtual and augmented reality, information & data visualization; Hypertext – finding things, Web Technology and related issues, Static web content, dynamic web content;

TEXT BOOK

1. Alan Dix, Janet Finlay, Gregory D. Abowd, Russell Beale, “Human Computer interaction”, Third Edition, Pearson Education, 2004.

REFERENCE

John M. Carrol, “Human Computer Interaction in the New Millennium”, Pearson Education, 2002.

ONLINE REFERENCES

- www.scis.nova.edu/nova/hci/notes.html

- http://courses.iicm.tugraz.at/hci/hci.pdf
- www.ida.liu.se/~miker/hci/course.html

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Subject Code	Title of the Subject
MC15L12	Open Elective

The syllabus will be framed based on the industry requirements at the time of option