Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Name of Program: MCA (BANKING TECHNOLOGY)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	THEORY END SEM University Exam	THEORY Two Term Exam	THEORY Teachers Assessment*	PRACTICAL END SEM University Exam	PRACTICAL Teachers Assessment*
MCBT301	COMPULSORY	Software Engineering	3	1	0	4	60	20	20	0	0

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical;   C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

*Teacher Assessment shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Education Objectives (CEOs):

- To provide knowledge about system development.
- To impart knowledge about software process models.
- To provide detailed knowledge about software design.
- To acquaint students with software quality and testing.
- To provide study of MIS.

Course Outcomes (COs): Students will be having:

- An ability to understand system design and its constraints.
- An ability to apply knowledge of software engineering.
- An ability to design a system, a component or process to meet desired needs.
- An ability to identify, formulate and solve engineering Problems
- An ability to measure and to understand quality issues.
- An ability to understand MIS and DSS.

UNIT -I

Introduction to Software Engineering: Software problem, Software engineering problem, Software engineering approach, Software characteristics and Applications. The system concept, characteristics of system, elements of system, The System Development Life Cycle, The Role of System Analyst.

UNIT -II

Software Processes: Software processes and its components, characteristics of software processes, Software development processes: Linear Sequential model, Prototyping model, RADmodel, Iterative

Enhancement model, Spiral model, Component based development,Comparative study of various development models. Fourth GenerationTechniques.

UNIT-III

Project Management Process & Project Planning: The People, Product, Process and Project, Phases of Project Management Process, The W5HH Principle. Software Configuration Management Process. Metrics and Measurements, Project Estimation (size & cost), Project Scheduling, Staffing and Personnel Planning, Risk analysis and Management, Miscellaneous Plans. Software Design: Design Principles, Cohesion & Coupling.

UNIT-IV

Software Quality Assurance: Quality Concepts, The Quality Movement, Software Quality Assurance, Software Reviews, Formal Technical Reviews, Formal Approaches to SQA, Statistical Software Quality Assurance, Software Reliability, Software Testing Techniques: Testing fundamentals, White box testing, Black box testing. Testing Strategies: A strategic approach of software testing strategic issues, unit testing, integration testing, validation testing, system testing.

UNIT-V

MIS & DSS: Introduction to MIS, long range planning, development and implementation of an MIS, applications of MIS in manufacturing sector and in service sector. Decision Support System concepts, types of DSS.

Suggested Readings:

1. R. S. Pressman, "Software Engineering – A practitioner's approach", 6th ed., McGraw Hill Int.
2. PankajJalote "Software Engg" Narosa Publications.
3. Ian Sommerville : Software Engineering 6/e (Addison-Wesley)
4. Richard Fairley : Software Engineering Concepts (TMH)
5. Elis Awad, "System Analysis & Design", Galgotia publications
6. W.S. Jawadekar: Management Information Systems, TMH Publication, India

PRACTICAL LIST

1. To study the Software Development Life Cycle.
2. To understand and apply good Software Analysis and Design practices
3. To study Data Flow Diagrams (DFDs) and levels in DFDs.
4. To create Data Dictionary for some applications
5. To use various information gathering tools (Questionnaire, Interview, On Site Survey)
6. To choose suitable software development process models for developing different applications.

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7. Perform Feasibility Study and to create Feasibility Report for applications.
8. To make decision whether to buy/lease/ develop the software.
9. To understand and create Use Case Diagram.
10. To study Functional Point Analysis.
11. To devise Test Cases for software testing, black-box, white-box testing and different types of testing.
12. To study the Risk Management during the software development.
13. To assure Quality of Software, Statistical Software Quality Assurance, Reliability of Software.
14. To understand and apply concepts of Project Management
15. Case study (MIS and DSS)

Name of Program: MCA(Banking Technology)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCBT 304	Compulsory	Banking Technology & Payment Systems	3	1	0	4	60	20	20	0	0

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*__Teacher Assessment__** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks

Course Education Objectives (CEOs):

This course is intended to provide the students an insight into the role played by technology in enhancing the effectiveness of the banking sector and also to provide strong foundation in the various technologies used for delivering Banking & Financial services. Apart from tracing the evolution of Banking Technology, this course will focus on current technologies as well as banking technologies of the future.

Course Outcomes (COs):

It will enable the students to envision the current and future requirements, architectures of banks and accordingly develop roadmap and strategies. It will help students appreciate the fact that technology cannot be viewed in isolation, which will be a crucial step in integrating the technology and business goals of banks.

UNIT – I

Banking Operations-Overview: Introduction to Banking, Evolution of Banking Technology, Impact of Technology on Banking operations. Centralized Banking- concepts and opportunities, Centralized Banking – Architectures, Challenges and Implementation & Management Issues.

UNIT – II

Delivery Channels: Products, Services & Delivery Technologies. ATM- technology and operations, Electronic Cards- debit and credits, Smart cards in banking/e-money Internet Banking Architecture and Implementation, Internet Banking/Mobile Banking management, Phone banking and call centres, Electronic Delivery Channels Integration.

UNIT – III

Back office Operations: Credit appraisal system, Forex management/SWIFT, Treasury management, Asset Liability management, Risk management- Operational risk, MIS/DSS/EIS for Banks, Data Centre and Business continuity management, Internal workflow operations, Corporate Intranet and Knowledge management, Technology & Human Resource management, IT Governance.

UNIT – IV

Electronic & Mobile Commerce: Introduction to Electronic Commerce, Business Models, Market Research and E-Commerce, Advertising in E-Commerce, Legal & Public policy issues relating to E-Commerce, Introduction to Mobile Commerce, Mobile Payments, Mobile banking, Mobile micro payments and mobile macro payments, Auctions, Agents in E-Commerce, E-Trading, B2B,B2C.

UNIT – V

Payment Systems: Introduction to Payment Systems, Payments through the Internet- privacy issues- Card based, net based payment systems, SET Protocol MICR, ECS, EFT, Global Payment Scenario – Interbank/Intrabank, RTGS, History of Money/Electronic Money/ Electronic cheques, Micro payments.

Suggested Readings:

1. Bank 3.0, Brett king, John wiley, 2013
2. The Art of Better Retail Banking, Hugh Croxford, Frank Abramson, Alex Jablonowski, John Wiley 2005
3. Business knowledge for IT in Retail Banking-Bizle Professional series, UK Edition, Essvale
   Corporation Ltd 2007.
4. Electronic Commerce, Bhaskar, Bharat, Tata McGraw Hill, New Delhi-2008.
5. Electronic Payment Systems for E-Commerce, Mahony D, Pierece M, Tiwari H, Artech

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

House Computer Security Series, 2001

REFERENCES:

1. Financial Services Information System, Jessica Keyes, Auerbach, 2000.
2. Technology management in financial services, Ross, McGill, Palgrave Macmillan, 2008.
3. Financial Technology management, Vol.1, Gulati, V.P., Srivasvatava, Shilpa; ICFAI University Press, 2008
4. Financial Technology management, Vol.2, Gulati, V.P., Srivasvatava, Shilpa; ICFAI University Press, 2008
5. Information Systems for Banks, Bhaskaran R, Taxmann, IIBF, 2005.
6. Electronic Commerce: A Managerial Perspective, Efrain Turban, Jae Lee, David King H, Michael Chang, Pearson Education, New Delhi 2001.

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCBT315	Elective	Computer Vision & Digital Image Processing	3	1	0	4	60	20	20	0	0

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical;   C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.
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Course objectives :

- to develop the understanding of the basic principles and techniques of image processing and image understanding
- to develop the skills in the design and implementation of computer vision software.
- To provide a n insight with the problem of capturing and making sense of digital images.

Course Outcomes: after completion of this course student will be able to

- explore some of the basic principles and techniques from these areas which are currently being used in real-world computer vision systems
- demonstrate knowledge and understanding of Human and computer vision systems
- understand and apply the current approaches to image formation and image modeling
- use the current approaches to basic image processing and computer vision
- develop a computer based system with the capabilities of the human eye-brain system.

Unit-I Introduction, **Computer Vision:** role, applications, successes, research issues; computer and natural vision, basic image properties.

Digital Image: basics, A simple model, Sampling and Quantization, properties. Relationship between pixels. Imaging geometry.

Unit II Digital image representation, steps in image processing, elements of digital image processing, systems digitization, Display and recording devices.

Unit III Image transformations, Introduction to Fourier transforms, Discrete Fourier transforms, Fast Fourier transform, Walsh transformation,

Image enhancement, Filters in spatial and frequency domains, Histogram based processing, Image subtraction, Averaging, Image smoothing, smoothing and sharpening filters, Nedion filtering, Low pass filtering, Image sharpening by High pass filtering.

Unit IV Image Encoding & Segmentation: Segmentation, Mapping, Quantizer, Coder. Error free compression, Lossy Compression schemes.JPEG Compression standard.detection of discontinuation by point detection, line detection, edge detection. Edge linking & Boundary Detection: Local analysis, global by Hough transform & Global by graph theoretic techniques.

Unit V Image Representation and Description: Chain codes, polygonal approximation, signatures, boundary segments, boundary descriptors, regional descriptors, introduction to image understanding. Motion Tracking, Image differencing, Feature matching, Optic flow

Suggested Readings:

1. M. Sonka, Digital Image Processing & Computer Vision , Cengage Learning
2. Jayaraman, Digital Image Processing, TMH.
3. Pratt, Digital Image Processing, Wiley India
4. Annadurai, Fundamentals of Digital Image Processing ,Pearson Education
5. Gonzalez and Woods "Digital Image Processing", Addition Wesley
6. Gonzalez and Woods "Digital Image Processing using MATLAB", Addition Wesley
7. SchalKoff: Digital Image Processing & Computer Vision, Addition Wesley.

8. Boyle and Thomas, ``Computer Vision - A First Course" 2nd Edition, ISBN 0-632-028-67X, Blackwell Science 1995.
9. Low, "Introductory Computer Vision and Image Processing", McGraw-Hill 1991, ISBN 0-07-707403-3

Name of Program: MCA+Ph.D. (Banking Technology)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCBT325	Elective	Advanced Computer Network	3	1	0	4	60	20	20	0	0

Legends: L – Lecture; T – Tutorial/Teacher Guided Student Activity; P – Practical; Q/A – Quiz/Assignment/Attendance; MST – Mid Semester Test.

*Teacher Assessment shall be based on following components:
Quiz/Assignment/Project/Participation in class activities, given that no component shall exceed more than 10 marks

Course Objectives:

- To uncover and understand the current directions of computer networks from literature readings.
- To expose students to the "full span" of the computer network's frontier {a breath goal}.
- To encourage a performance perspective towards analysis of computer and communications Networks.
- To "fill-in" gaps in students' networking knowledge.

Course Outcomes:

- To master the terminology and concept of the OSI reference model and the TCP/IP reference model.
- To master the concepts of protocols, network interfaces, and design/ performance issues in local area networks and wide area networks.
- To be familiar with wireless networking concepts.
- To be familiar with contemporary issues in networking technologies.
- To be familiar with network tools and network programming

Unit-I

Network Planning: Introduction, wireless network topologies, cellular topology.
Wireless network operation: introduction, mobility management, radio resources and power management, security in wireless networks

Unit-II
Mobile Data Networks

Introduction: Data-oriented CDPD network, GPRS and higher data rates, short messaging services in GSM, mobile application protocols.

Wireless LANs (WLAN)

Introduction: Historical overview of the LAN industry, evolution of the WLAN industry, interest from military and service providers, New explosion of market and technology, wireless home networking.

Unit-III IEEE 802.11 WLANs

Introduction: IEEE 802.11, PHY layer, MAC sub layer, MAC management sub layer.
Wireless Geolocation: Wireless Geolocation Systems, Wireless geolocation system architecture, for wireless geolocation Technologies, geolocation standards for E-911 services, performance measures for geolocation systems.

Unit-IV Wireless Personal Area Network (WPAN)

Introduction: IEEE 802.15 WPAN, Home RF, Bluetooth, Interference between Bluetooth and 802.11.
Satellite navigation and global positioning system: Introduction, radio and satellite navigation, GPS position location principles, GPS time, GPS receivers and codes, the C/A code, Satellite signal acquisition, GPS signal levels, timing accuracy, GPS receiver operation, GPS C/A code accuracy, differential GPS.

Unit-V
Optical Networks

Network Concepts: terminology, categories, layers. Network topologies: performance of passive linear buses, performance of star architectures.
Optical switching: optical cross-connect, wavelength conversion, wavelength routing, optical packet switching, optical burst switching. WDM network examples: wideband long-haul WDM networks, narrowband metro WDM networks, passive optical network.

Suggested Readings:
1. K. Pahlavan and P. Krishnamurthy: Principles of Wireless Networks, PHI Learning.
2. G. Keiser: Optical Fiber Communications, 4th Edition, TMH New Delhi.
3. T. Pratt, C. Bostian and J. Allnut: Satellite Communications, 2nd Edition, Wiley Indian Pvt. Ltd.
4. UpenaDalal: Wireless Communications, Oxford University Press.

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Name of Program: MCA+Ph.D. (Banking Technology)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCCA301	Elective	Design & Analysis of Algorithm	3	1	0	4	60	20	20	0	0

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.
*Teacher Assessment shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Educational Objectives (CEOs):
- To familiarize the students with the need and scope of the subject.
- To develop the analytical skills of students so that they can better understand the problem and devise algorithms efficiently.
- Using simple and well drawn illustrations develop their analytical and programming skills.
- To cover the various data structures and their applications so that aspirants can explore this territory
- to take on the more challenging concepts.

Course Outcomes (Cos): After the completion of the course the student will be able to
- Understand the real world problems and model them
- Understand the algorithms and the algorithm design process
- Choose a suitable strategy to devise solution of a given problem
- identify, formulate and solve programming problems
- select appropriate data structures for the solution of a given problem
- analyze the algorithms for correctness and in terms of complexity for best, worst and average cases
- function on multi-disciplinary teams
- understand the professional and ethical responsibility

Unit-I
Pre-requisites: Data structure and Discrete structures, models of computation, **Introduction to Algorithm:** Definition, Criteria of Algorithm, Algorithm Analysis, Time and Space complexity, asymptotic notation: Big Oh, Omega and Theta, Best, Average and Worst case analysis.

Unit-II
Design of Algorithm, Types of algorithm strategies, Recurrence relation: Master method, Substitution method, Analysis of algorithm, Brute-force approach: Sequential search, Selection sort
Divide and conquer: Structure of divide-and-conquer algorithms: examples; Binary search, Merge sort, Quick sort, Strassen's Multiplication; Analysis of divide and conquer methods
Unit-III
Graph searching and Traversal: Overview, Traversal methods (depth first and breadth first search)

Greedy Method: Overview of the greedy paradigm examples of exact optimization solution (minimum cost spanning tree), Approximate solution (Knapsack problem), Single source shortest paths.

Branch and bound: LC searching Bounding, FIFO branch and bound, LC branch and bound application: 0/1 Knapsack problem, Traveling Salesman Problem, searching & sorting algorithms.

Unit-IV
Dynamic programming: An Overview, Difference between Dynamic Programming and Divide And Conquer, Applications: Shortest Path in Graph, Matrix Chain Multiplication, Traveling Salesman Problem, Longest Common Sequence.

Back tracking: Overview, 8-queen problem and Knapsack problem

Unit-V
Computational Complexity: Complexity measures, Polynomial Vs non-polynomial time complexity; NP-hard and NP-complete classes, Relation among P, NP, NPC and NPH. Examples. Combinational algorithms, string processing algorithm, Algebraic algorithms, set algorithms

Suggested Readings:
1. Ullman, "Analysis and Design of Algorithm", TMH
2. Goodman, "Introduction to the Design & Analysis of Algorithms, TMH-2002.
3. Sara Basse, A. V. Gelder, "Computer Algorithms," Addison Wesley
4. T. H. Cormen, Leiserson, Rivest and Stein, "Introduction of Computer algorithm," PHI
5. E. Horowitz, S. Sahni, and S. Rajsekaran, "Fundamentals of Computer Algorithms," Galgotia Publication
Note : Paper is to be set unit wise with internal choice.

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MCBT 306	Compulsory	Lab-1 (Banking Technology Lab)	0	0	4	2	0	0	0	30	20

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Course Outcomes (COs):

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Note: Labs Shall be conducted as per the prescribed syllabus.

Suggested Readings:

1. Bank 3.0, Brett king, John wiley, 2013
2. The Art of Better Retail Banking, Hugh Croxford, Frank Abramson, Alex Jablonowski, John Wiley 2005
3. Business knowledge for IT in Retail Banking-Bizle Professional series, UK Edition, Essvale
   Corporation Ltd 2007.
4. Electronic Commerce, Bhaskar, Bharat, Tata McGraw Hill, New Delhi-2008.
5. Electronic Payment Systems for E-Commerce, Mahony D, Pierece M, Tiwari H, Artech

House Computer Security Series, 2001

6. Financial Services Information System, Jessica Keyes, Auerbach, 2000.
7. Technology management in financial services, Ross, McGill, Palgrave Macmillan, 2008.

8. Financial Technology management, Vol.1, Gulati, V.P., Srivasvatava, Shilpa; ICFAI University Press, 2008
9. Financial Technology management, Vol.2, Gulati, V.P., Srivasvatava, Shilpa; ICFAI University Press, 2008
10. Information Systems for Banks, Bhaskaran R, Taxmann, IIBF, 2005.
11. Electronic Commerce: A Managerial Perspective, Efrain Turban, Jae Lee, David King H, Michael Chang, Pearson Education, New Delhi 2001.

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MCBT307	Compulsory	Lab-2 (Software Engineering Lab)	0	0	4	2	0	0	0	30	20

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- To acquaint students with software quality and testing.
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- An ability to apply knowledge of software engineering.

- An ability to design a system, a component or process to meet desired needs.
- An ability to identify, formulate and solve engineering Problems
- An ability to measure and to understand quality issues.
- An ability to understand MIS and DSS.

PRACTICAL LIST

1. To study the Software Development Life Cycle.
2. To understand and apply good Software Analysis and Design practices
3. To study Data Flow Diagrams (DFDs) and levels in DFDs.
4. To create Data Dictionary for some applications
5. To use various information gathering tools (Questionnaire, Interview, On Site Survey)
6. To choose suitable software development process models for developing different applications.
7. Perform Feasibility Study and to create Feasibility Report for applications.
8. To make decision whether to buy/lease/ develop the software.
9. To understand and create Use Case Diagram.
10. To study Functional Point Analysis.
11. To devise Test Cases for software testing, black-box, white-box testing and different types of testing.
12. To study the Risk Management during the software development.
13. To assure Quality of Software, Statistical Software Quality Assurance, Reliability of Software.
14. To understand and apply concepts of Project Management
15. Case study (MIS and DSS)

Suggested Readings:

1. R. S. Pressman, "Software Engineering – A practitioner's approach", 6th ed., McGraw Hill Int.
2. PankajJalote "Software Engg" Narosa Publications.
3. Ian Sommerville : Software Engineering 6/e (Addison-Wesley)
4. Richard Fairley : Software Engineering Concepts (TMH)
5. Elis Awad, "System Analysis & Design", Galgotia publications
6. W.S. Jawadekar: Management Information Systems, TMH Publication, India