ShriVaishnavVidhyapeethVishvavidhyalaya, Indore

Institute of Computer Applications

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*
MCBT101	COMPULSORY	Operating System	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):-

1. To provide knowledge of the underlying principles, techniques and approaches of designing an operating systems.
2. To provide the knowledge of inherent functionality and processing of program execution.
3. To emphasize on how the various elements that underlie operating system interact and provides services for execution of application software
4. To make the students aware with the different Operating Systems.

Course Outcomes (COs): After the completion of the course student will be able to

1. Understand the functions, structures and history of operating systems.
2. Understand the design issues associated with operating systems.
3. Understand and apply various process management concepts including scheduling, synchronization, deadlocks and multithreading.
4. Demonstrate the concepts of memory management including virtual memory.
5. Master system resources sharing among the users.
6. Apply the knowledge related to file system interface and implementation, disk management.
7. Be familiar with protection and security mechanisms.
8. Be familiar with various types of operating systems including Unix.
9. Students will demonstrate knowledge of process control, threads, concurrency, memory management scheduling, I/O and files, distributed systems, security, networking.
10. Enumerate and explain the function of the common operating system kernel routines that are provided by an operating system.

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UNIT - I

Introduction: Evolution of OS with the generations of computers. Goals, Objectives, Functions of Operating System, Types of operating systems: Batch Processing, Multitasking, Multithreading, Multiprogramming and Real time operating systems etc. Different views of the operating system, System Programmer's view, User's view, Operating System structure: Layered Operating Systems, Monolithic Systems.

UNIT – II

CPU Scheduling: The Process concept, the process control block. Types of schedulers, Scheduling Criteria, Scheduling Algorithms.

Deadlocks: Deadlock, Condition for deadlock, Deadlock Prevention, Deadlock detection, Deadlock avoidance, Deadlock recovery, Starvation.

UNIT – III

Memory Management : Memory management without swapping or paging, Concept benefits of Virtual memory, Concepts of swapping and paging, Fragmentation, Page replacement algorithms, Belady's anomaly and the category of Stack algorithms, Modeling paging algorithms, Design issues for paging system, Segmentation.

Disks: Disk hardware, Disk I/O & Disk performance parameters and Disk scheduling policies and algorithms.

UNIT - IV

C**oncurrency and Synchronization:** The need for inter-process synchronization, Principles of concurrency, Process interaction, Requirement for Mutual Exclusion, Mutual Exclusion Software Applications, Decker's algorithms, Mutual Exclusion Hardware support, Semaphore, Classical problems in concurrent programming, Dining Philosopher's problem, Bounded Buffer Problem, Sleeping Barber Problem, Readers and Writers problem, Critical section, critical region and conditional critical region, Monitors and messages.

UNIT-V

LINUX: History & Features of Linux, Linux Architecture, File System of Linux, Hardware Requirements of Linux, Various flavors of Linux, Linux Standard Directories, Functions of Profile and Login Files in Linux, Linux Kernel.

Suggested Readings:

1. Deitel, H.M. "An Introduction to Operating Systems". Addison Wesley Publishing, 1984.
2. Milenkovic, M., "Operating Systems - concepts and Design" McGraw Hill International Edition-1992.
3. Galvin P., J.L. Abraham Silberschatz. "Operating System Concepts". John Wiley & Sons, 1989.
4. Tanenbaum, A.S. "Modern Operating System", Prentice Hall of India Pvt. Ltd.1995.

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5. William Stallings "Operating Systems" , Prentice Hall of India Pvt. Ltd.

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MCBT102	COMPULSORY	Programming using C	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 be exceed 10 Marks)

Course Education Objective (CEOs):

The languages that programmers use are constantly changing, and the popular languages of today will surely be replaced by new ones. The objective of this course is to provide students with a working knowledge of the basic principles underlying the design of all computer programming languages.

Course Outcome (COs)s: Students completing this course should be able to quickly learn to effectively use new computer programming languages. In particular, after taking this course students should be able to do the following:

- Evaluate programming language features and designs.
- Solve problems using the functional, object-oriented, and declarative paradigms.
- Describe the strengths and limitations of the imperative, functional and object-oriented paradigms for solving different kinds of problems (or in different application domains), especially in relation to each other.
- Explain and answer questions about specific languages that illustrate different paradigms, including questions about relevant concepts and major features.
- Design, define, and evaluate parts of programming languages or similar systems and justify your design decisions.

Unit I:

Concept of problem solving: Problem definition, Flowcharting, Decision table, Categories of Programming Languages, Programming Paradigms: monolithic, Procedural, structured, Non Procedural Types of errors in programming Debugging. **Overview of C:** History of C, Features of C, Structure of C program. Elements of C: C character set, identifiers and keywords, data types: primitive and user defined, Constants and variables.

UNIT II:

Operators and Expressions: Arithmetic, relational, logical, bitwise, unary, assignment and conditional operators and their precedence and associatively, Type modifiers and type casting. Control Structures – Statement Level, Compound Statements, Selection, Iteration.
Input/ Output: Unformatted and Formatted I/O functions in C.

Unit III:

Functions: Definition, Function call, parameters, parameters passing – call by value, call by reference. Return value. Storage Classes in C: auto, extern, register and static storage class, their scope, storage and recursion, Recursion v/s Iteration, types of recursion. Special constructs – Break, continue, exit(), go to and labels;
Arrays: Definition, Access of Elements, initialization; Multidimensional arrays, character arrays.

Unit IV:

Pointer: Declaration, assignment, initialization, comparison, conversion and arithmetic of pointers. pointer to pointer. pointer and arrays, Array of pointers and its limitation, Dynamic memory management using functions like malloc(), calloc(), realloc(), free() etc.. Function returning pointers; Pointer to function, Function as parameter.
Structure: Structure –basic, declaration, membership operator, pointer to structure, Union.

Unit V:

String Manipulation Operations: strlen(),strcpy(),strcat(),strcmp()
Pre-processor directives: #include, #define, #if, #undef, #error, #pragma. Predefined macros. Command line arguments. Variable argument list functions.

Suggested Readings::

1. *Kanitkar Yashwant, 'Let us C', BPB New Delhi*
2. *Balaguruswami, 'Ansi C', TMH, Delhi*
3. *Kerninghan& Ritchie, "The C programming language", PHI*
4. *Schildt, "C: The Complete reference" 4th ed TMH.*
5. *Cooper Mullish, "The Spirit of C", Jaico Publishing House, Delhi*
6. *Byron S. Gottfried, "Programming with C", Schaum's Outline Series Mcgraw –Hill, II-Ed.*
7. *Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education, 2008.*
8. *Programming Language Design Concepts, D. A. Watt, Wiley dreamtech,rp-2007.*

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MCBT104	Compulsory	IT Infrastructure Management for Banks	3	1	0	4	60	20	20	0	0

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Course Education Objectives (CEOs):

The objective of this course is to expose the emerging area of IT Infrastructure and its Management. It focuses on Server Management and Data Center management. It also deals with the IT Services Management. This course comprehensively deals with Service Transition principles and Continual Service Improvement principles.

Course Outcomes (COs):

After successful completion of this course students will be able to manage the basic IT infrastructure of banking and financial services sector. They will be able to effectively handle the security issues, design principles of servers and data centers which are the basic blocks of IT infrastructure. They will be able to design and manage various IT services through well defined procedures available.

UNIT I
Server Management - Storage Management, Application Management, Information Life Cycle Management, Network Management, Security Management, Tools and Standards for Server, Storage, Application, Information Life Cycle Management, Network and Security Management**.**

UNIT II
Data Center Management - Data Center Basics, Data Center Architecture, Data Center Design, Data Center Network Design, Data Center Maintenance, Data Center HVAC, Data Center consolidation.

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UNIT III

IT Services Management – Service Management as a practice, Service strategy principles, Service economics, Strategy and Organization - Strategy, tactics and operations – ServiceDesign principles, Service Design processes, Service Design Technology related activities, Implementing Service Design.

UNIT IV

Service Transition principles - Service Transition processes, Service Transition common operation - implementing service transition: challenges, critical success factors and risk – Service Operation principles: Service Operation processes, Common Service Operation activities, implementing service operation.

UNIT V

Continual Service Improvement principles - Continual Service Improvement processes, Continual Service Improvement methods and techniques, Implementing Continual Service Improvement.

Suggested Readings:

1. Office of Government Commerce, "ITIL - Service Strategy", TSO publications, London, 2007
2. Office of Government Commerce, "ITIL - Service Design", TSO publications, London, 2007
3. Office of Government Commerce, "ITIL - Service Transition", TSO publications, London, 2007
4. Office of Government Commerce, "ITIL - Service Operation", TSO publications, London, 2007
5. Office of Government Commerce, "ITIL - Continual Service Improvement", TSO publications, London, 2007
6. Kailash Jayaswal, "Administering Data Centers: Servers, Storage and Voice over IP", Wiley Publications
7. EMC, Information Storage Management: "Storing, Managing and Protecting Digital Information", Wiley 2009
8. Gilbert Held, "Server Management: Best Practices Series", Aurebach Publications, 2000
9. Stephan R. Kass, "Information Life Cycle Management", Woodhead Publishing, 2006
10. Alexander Clemm, "Network Management Fundamentals", Cisco Press, 2006

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COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
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MCBT105	COMPULSORY	Data Warehousing and Mining	3	1	0	4	60	20	20	0	0

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Course Education Objectives (CEOs): This course is an attempt to provide students with the basic information about data warehouse and their development. This course also provides the basic conceptual background necessary to design and develop data ware house applications.

Course Outcomes (COs): After completing this course, students will learn various tools and techniques which are prominent from Industrial point of view. Students will acquire the abilities to create an integrated data warehouse and the ability to design, maintenance, and the development of a simple data warehouse.

Unit-1: Data Warehouse: Introduction, OLTP Systems, Characteristics & Functions of Data Warehouses, Advantages and Applications of Data Warehouse, Tools for Data Warehouse Development, Data Warehouse Types.

Planning and Requirements: Key Issues in Planning a Data Warehouse, Planning and Project Management in Data Warehouse Construction, Data Warehouse Project.

Unit-2: Data Warehouse Architecture: Components of Data Warehouse Architecture, Tool Selection.

Dimensional Modeling: E-R Modeling, Dimensional Modeling, E-R Modeling VS Dimensional Modeling, Data Warehouse Schemas: Snowflake Schema, Fact Constellation Schema.

Extract, Transform and Load: ETL Overview, ETL Requirements and Steps, Data Transformation, Data Loading, ETL Tools.

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Unit-3: Data Warehouse & OLAP: What is OLAP? Multidimensional Data, OLAP Architectures, Data Warehouse and OLAP, Hypercube & Multicubes.
Metadata Management in Data Warehouse: Introduction to Metadata, Categorizing Metadata.

Unit-4: Data Mining: Introduction, Need, Definitions, Evolution, Relation between Data Warehousing and Data Mining, Data Mining and Knowledge Discovery Process, Data Mining Versus Database Management System (DBMS), Data Mining and Different kind of Data, Data Mining and Online Analytical Processing (OLAP).

Data Preprocessing: Introduction, Need, Data Preprocessing as a process, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

Unit-5: Data Mining Functionalities, Introduction of Mining Frequent Patterns, Association Rules and Correlations, Classification and Prediction, Cluster Analysis, Web Mining, Issues in Data Mining, Applications of Data Mining, Recent Trends.

Suggested Readings:

1. Paulraj Ponniah, "Data Warehousing: Fundamentals for IT professionals", John Wiley & Sons, 2010.
2. W. H. Inmon, "Building the Operational Data Store", 2nd edition, John Wiley and Sons, 1999
3. W. H. Inmon, "Building the Data Warehouse", 3rd edition, John Wiley and Sons, 2002
4. Alex Berson , "Data Warehousing, Data Mining, and OLAP", First Edition, Tata McGraw Hill
5. Mark W. Humphries and Michael W. Hawkins, "Data Warehousing: Architecture & Implementation", Prentice Hall

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCBT106	COMPULSORY	Lab-1 (Programming Lab in C)	0	0	4	2	0	0	0	30	20

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Course Education Objective (CEOs):

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Course Outcome (COs)s: Students completing this course should be able to quickly learn to effectively use new computer programming languages. In particular, after taking this course students should be able to do the following:

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- Solve problems using the functional, object-oriented, and declarative paradigms.
- Describe the strengths and limitations of the imperative, functional and object-oriented paradigms for solving different kinds of problems (or in different application domains), especially in relation to each other.
- Explain and answer questions about specific languages that illustrate different paradigms, including questions about relevant concepts and major features.

- Design, define, and evaluate parts of programming languages or similar systems and justify your design decisions.
- develop a software and/or algorithmic solution to the task or problem
- implement solutions to meet high quality requirements developed by the supervisor
- carry out research under supervision
- present the research in a written form like that used for published papers
- present the research in an oral seminar.

List of Experiments:

1. Define an algorithm and flowchart. Draw algorithm and flow chart for a program that converts an input Fahrenheit degree into Celsius equivalent.
2. Write an algorithm and a C program to find the greatest among three numbers.
3. WAP to print an input string in lower case, upper case and mixed case using library function.
4. WAP a C program to reserve an input number.
5. Draw a flow chart to find prime number from 1 to 100.
6. Write a C program to obtain the sum of first n terms of the following series:
   $X - X^3/3! + X^5/5! - X^7/7! + \ldots..$
7. WAP to calculate factorial of a number using different loops.
8. WAP to calculate factorial of a number using recursion.
9. WAP in C to generate Fibonacci series.
10. WAP in C to generate Pascal triangle.
11. WAP in C to swap value and address of two variables.

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12. WAP in C to search a given element in an array using linear and binary search.
13. WAP to sort an integer array in ascending and descending order according to user's choice.
14. Write a menu driven program to perform matrix addition, subtraction and multiplication.
15. Write a program to sum diagonal elements of two matrices.
16. WAP a C program to reverse a string by recursion.
17. WAP using structure in C to generate student mark-sheet for 3 students with student details name, course, and semester and with marks in 5 subjects, assume max mark in each subject as 100 and passing marks as 35.

Suggested Readings:

1. *KanitkarYashwant, 'Let us C', BPB New Delhi*
2. *Balaguruswami, 'Ansi C', TMH, Delhi*
3. *Kerninghan& Ritchie, "The C programming language", PHI*
4. *Schildt, "C:The Complete reference" 4th ed TMH.*
5. *Cooper Mullish, "The Spirit of C", Jaico Publishing House, Delhi*
6. *Byron S. Gottfried, "Programming with C", Schaum's Outline Series Mcgraw –Hill, II-Ed.*
7. *Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education, 2008.*
8. *Programming Language Design Concepts, D. A. Watt, Wiley dreamtech,rp-2007.*

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							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCBT107	COMPULSORY	Lab-2 (Operating System Lab)	0	0	4	2	0	0	0	30	20

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***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):-

1. To provide knowledge of the underlying principles, techniques and approaches of designing an operating systems.
2. To provide the knowledge of inherent functionality and processing of program execution.
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4. To make the students aware with the different Operating Systems.

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Course Outcomes (COs): After the completion of the course student will be able to

1. Understand the functions, structures and history of operating systems.
2. Understand the design issues associated with operating systems.
3. Understand and apply various process management concepts including scheduling, synchronization, deadlocks and multithreading.
4. Demonstrate the concepts of memory management including virtual memory.
5. Master system resources sharing among the users.
6. Apply the knowledge related to file system interface and implementation, disk management.
7. Be familiar with protection and security mechanisms.
8. Be familiar with various types of operating systems including Unix.
9. Students will demonstrate knowledge of process control, threads, concurrency, memory management scheduling, I/O and files, distributed systems, security, networking.
10. Enumerate and explain the function of the common operating system kernel routines that are provided by an operating system.

Note : The labs shall be conducted as per the prescribed syllabus.

Suggested Readings:

1. Deitel, H.M. "An Introduction to Operating Systems". Addison Wesley Publishing, 1984.
2. Milenkovic, M., "Operating Systems - concepts and Design" McGraw Hill International Edition-1992.
3. Galvin P., J.L. Abraham Silberschatz. "Operating System Concepts". John Wiley & Sons, 1989.
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