



T. JOHN INSTITUTE OF TECHNOLOGY

#86/1, Gottigere, Bannerghatta Road, Bangalore - 83

Department Of Master Of Computer Applications

Academic Year: 2010– 2011

Title: Lesson Plan

Semester	Branch	Subject & Code	Section	Name of the Staff
III	MCA	10MCA31 Systems Software	-	SUNIL KUMAR M ASST.PROF Dept of MCA

Sl. No,	Topics to be Covered	Period	Remarks
Unit-I		06	
1.	Machine Architecture : Introduction	1	
2.	System Software and Machine Architecture	2	
3.	Simplified Instructional Computer (SIC) - SIC Machine Architecture	3	
4.	SIC/XE Machine Architecture	4	
5.	SIC Programming Examples	5	
6.	SIC Programming Examples	6	
Unit-II		12	
7.	Assemblers Basic Assembler Function - A Simple SIC Assembler,	7	
8.	Assembler Algorithm and Data Structures	8,9,10	
9.	Machine Dependent Assembler Features- Instruction Formats & Addressing Modes	11	
10.	Program Relocation. Machine Independent Assembler Features – Literals	12	
11.	Symbol-Definition Statements, Expression, Program Blocks	13	
12.	Control Sections and Programming Linking	14	
13.	Assembler Design Operations - One-Pass Assembler	15,16	
14.	Multi-Pass Assembler	17	
15.	Implementation Examples- MASM Assembler	18	
Unit-III		08	
16.	Loaders and Linkers Basic Loader Functions - Design of an Absolute Loader,	19	
17.	A Simple Bootstrap Loader	20	
18.	Machine-Dependent Loader Features – Relocation, Program Linking	21	
19.	Algorithm and Data Structures for a Linking Loader	22	

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20.	Machine- Independent Loader Features - Automatic Library Search	23	
21.	Loader Options, Loader Design Option - Linkage Editor	24	
22.	Dynamic Linkage, Bootstrap Loaders	25	
23.	Implementation Examples - MS-DOS Linker	26	
Unit-IV		06	
24.	Editors And Debugging Systems: Text Editors - Overview of Editing Process	27	
25.	Editor Structure, Interactive Debugging Systems	28	
26.	Debugging Functions and Capabilities	29	
27.	Relationship With Other Parts Of The System	30	
28.	User Interface	31	
29.	User-Interface Criteria	32	
Unit-V		08	
30.	Macro Processor: Basic Macro Processor Functions - Macro Definitions and Expansion	33	
31.	Macro Processor Algorithm and Data Structures	34,35	
32.	Machine-Independent Macro Processor Features - Concatenation of Macro Parameters	36	
33.	Generation of Unique Labels, Conditional Macro Expansion	37	
34.	Keyword Macro Parameters, Macro Processor Design Options - Recursive Macro Expansion	38	
35.	General-Purpose Macro Processors, Macro Processing Within Language Translators	39	
36.	Implementation Examples - MASM Macro Processor, ANSI C Macro Processor.	40	
Unit-VI		12	
37.	Lex and Yacc: Lex and Yacc - The Simplest Lex Program, Recognizing Words With LEX,	41,42	
38.	Symbol Tables, Grammars	43	
39.	Parser- Lexer Communication, The Parts of Speech Lexer	44	
40.	A YACC Parser, The Rules Section, Running LEX and YACC	45	
41.	LEX and Hand- Written Lexers, Using LEX - Regular Expression, Examples of Regular Expressions	46	



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42.	A Word Counting Program, Parsing a Command Line	47	
43.	Using YACC – Grammars, Recursive Rules,	48	
44.	Shift/Reduce Parsing, What YACC Cannot Parse	49	
45.	A YACC Parser - The Definition Section, The Rules Section	50	
46.	Symbol Values and Actions, The LEXER, Compiling and Running a Simple Parser	51	
47.	Arithmetic Expressions and Ambiguity Variables and Typed Tokens	52	

Text Books

1. Leland.L.Beck: System Software, 3rd Edition, Pearson Education, 1997. (Chapters 1.1 to 1.3, 2 (except 2.5.2 and 2.5.3), 3 (except 3.5.2 and 3.5.3), 4 (except 4.4.3))
2. John.R.Levine, Tony Mason and Doug Brown: Lex and Yacc, O'Reilly, SPD, 1998. (Chapters 1, 2 (Page 2-42), 3 (Page 51-65))

Reference Books:

1. D.M.Dhamdhere: System Programming and Operating Systems, 2nd Edition, Tata McGraw - Hill, 1999.



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Title: Lesson Plan

Semester	Branch	Subject & Code	Section	Name of the Staff
III	MCA	10MCA32 Computer Networks	-	GOMATHY PRATHIMA E Sr.Lecturer Dept of MCA
Sl. No,	Topics to be Covered		Period	Remarks
Unit-I			08	
1.	Building a network		1	
2.	Applications		1	
3.	Requirements		1	
4.	Network Architecture		2	
5.	Implementing Network Software		2	
6.	Performance		1	
Unit-II			12	
7.	Physically connecting hosts		2	
8.	Hardware building blocks		1	
9.	Encoding		1	
10.	Framing		1	
11.	Error detection		1	
12.	Reliable transmission		1	
13.	Ethernet(802.3)		1	
14.	Ring		1	
15.	802.5, FDDI,802.17		1	
16.	Wireless(802.15.1, 802.11,802.16, Cell Phone Technologies)		2	
Unit-III			07	
17.	Switching and forwarding		04	
18.	Bridges and LAN Switches		03	
Unit-IV			12	
19.	Simple internetworking (IP)		4	

20.	Routing	5	
21.	Global Internet	3	
Unit-IV		07	
22.	Simple demultiplexer (UDP)	2	
23.	Reliable byte stream (TCP)	3	
24.	Issues in Resource allocation	2	
Unit-V		6	
25.	Application-Layer overview, Domain Name System	1	
26.	Remote Login protocols	1	
27.	Electronic mail	1	
28.	File transfer and FTP	1	
29.	World Wide Web and HTTP	1	
30.	Overview of VoIP telephony, VoIP signaling protocols	1	

Text Books :

1. **Computer Networks – A Systems Approach, 4th Edition**, Larry L. Pearson and Bruce S. Davie, Elsevier, 2010
(Chapter 1, 2, 3.1, 3.2, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1).
2. **Computer and Communication Networks**, Nader F. Mir, Pearson Education, 2007.
(Chapter 2, 3, 4, 5.1, 5.2, 5.4, 5.5).

Reference Books:

1. **Data Communication and Networking, 4th Edition**, Behrouz A. Forouzan, Tata McGraw-Hill, 2006
2. **Data and Computer Communication, 8th Edition**, William Stallings, Pearson Education, 2007
3. **Communication Networks – Fundamental Concepts and Key architectures, 2nd Edition**, Alberto Leon-Garcia and Indraja Widjaja, Tata McGraw-Hill, 2004



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Title: Lesson Plan

Semester	Branch	Subject & Code	Section	Name of the Staff
III	MCA	10MCA33 Programming with Java	-	YASWANTH RAO G Lecturer Dept of MCA

Sl. No,	Topics to be Covered	Period	Remarks
Unit-I		04	
1.	Object-Oriented Programming, A First Simple Program, A Second Short Program, Using Blocks of Code Lexical Issues, The Java Class Libraries.	1	
2.	Data Types, Variables, and Arrays: Java Is a Strongly Typed Language, The Primitive Types, A Closer Look at Literals, Variables, Type Conversion and casting, Automatic Type promotion in Expression, Arrays, A few words about Strings	2	
3.	Operators: Arithmetic Operators, The Bitwise Operators, Relational Operators Boolean Logical Operators, The Assignment Operator, The ? Operator, Operator Precedence, Using Parentheses	3	
4.	Control Statements: Java's Selection, Iteration Statements, Jump Statements.	4	
Unit-II		07	
5.	Class Fundamentals, Declaring Objects, Assigning Object Reference Variables Introducing Methods	5	
6.	Constructors, The this Keyword, Garbage, The finalize() Method A Stack Class	6	
7.	A Closer Look at Methods and Classes: Overloading Methods, Overloading Constructors	7	
8.	Using Objects as Parameters ,A Closer Look at Argument Passing, Returning Objects, Recursion, Introducing Access Control	8	
9.	Understanding static ,Introducing final, Arrays Revisited	9	
10.	Introducing Nested and Inner Classes, Exploring the String Class	10	
11.	Using Command-Line Arguments, Varargs	11	
Unit-III		07	
12.	Inheritance: Inheritance Basics, Using super, Using super Creating a Multilevel Hierarchy, When Constructors Are Called	12	
13.	Method Overriding, Dynamic Method Dispatch, Using	13	

	Abstract Classes, Using final with Inheritance		
14.	The Object Class. Packages and Interfaces: Packages, Access Protection, An Access Example Importing Packages, Interfaces	14	
15.	Exception Handling: Exception-Handling Fundamentals, Exception Types	15	
16.	Uncaught Exceptions Using try and catch, Multiple catch Clauses, Nested try Statements	16	
17.	throw, throws, finally, Java’s Built-in Exceptions	17	
18.	Creating Your Own Exception Subclasses, Chained Exceptions, Using Exceptions.	18	
Unit-IV		06	
19.	Multithreaded Programming: The Java Thread Model, The Main Thread, Creating a Thread, Creating Multiple Threads, Using isAlive() and join()	19	
20.	Thread Priorities, Synchronization, Interthread Communication, Suspending, Resuming, and Stopping Threads, Using Multithreading	20	
21.	Input/Output: Exploring java.io: The Java I/O Classes and Interfaces	21	
22.	File, The Closable and Flushable Interfaces, The Stream Classes	22	
23.	The Byte Streams, The Character Streams	23	
24.	The Console Class, Using Stream I/O, Serialization, Stream Benefits	24	
Unit-V		06	
25.	Enumeration, Autoboxing: Enumeration, Type Wrappers, Autoboxing. Generics: What are Generics?, A Simple Generics Example	25	
26.	A Generics Class with two Type Parameters, The General Form of a Generic Class	26	
27.	String Handling: The String Constructors, String Length, Special String Operations, Character Extraction, String Comparison	27	
28.	Searching Strings, Modifying a String, Data Conversion Using valueOf()	28	
29.	Changing the Case of Characters Within a String	29	
30.	Additional String Methods, StringBuffer, String Builder.	30	
Unit-VI		07	
31.	Exploring java.lang: Primitive Type Wrappers, System, Object, Class, Class Loader	31	

32.	Math, Thread, ThreadGroup, Runnable, Throwable	32	
33.	The Collections Framework: Collections Overview,	33	
34.	The Collection Interfaces	34	
35.	The List Interface, The Queue Interface	35	
36.	The Collection Classes, The ArrayList Class	36	
37.	The LinkedList Class, The HashSet, The TreeSet Class.	37	
Unit-VII		05	
38.	Networking: Networking Basics	38	
39.	The Networking Classes and Interfaces InetAddress	39	
40.	TCP/IP Client Sockets, URL, URL Connection	40	
41.	HTTP URL Connection, TCP/IP Server Sockets	41	
42.	Cookies, InetAddress and Inet6Address, The URI Class, RMI.	42	
Unit-VIII		07	
43.	The Applet Class: The Applet Class	43	
44.	Event Handling: Two Event Handling Mechanisms,	44	
45.	The Delegation Event Model	45	
46.	Event Classes, Sources of Events	46	
47.	Event Listener Interfaces	47	
48.	Using the Delegation Event Model	48	
49.	Adapter Classes, Inner Classes	49	
Unit-IX		03	
50.	Swing: Introducing Swing	50,51	
51.	Exploring Swing	52	

Text Books:

1. Herbert Schildt: The Complete Reference JAVA, 7th Edition, Tata McGrawHill, 2006. (Chapters: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21, 22, 27, 29, 30)

Reference Books:

1. Raghavan P, Suresh Kumar T V: Programming with Java, Sanguine-Pearson, 2010.



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2. James P Cohoon, Jack W Davidson: Programming in JAVA 5.0, Tata McGraw Hill, 2007.
- 3 Cay S Horstmann, Gary Cornell: Core Java 2 - Volume 1, 7th Edition, Pearson Education, 2005.
4. Cay S Horstmann, Gary Cornell: Core Java 2 - Volume 2, 8th Edition, Pearson Education, 2008.
5. Y. Daniel Liang: Introduction to JAVA Programming, 7th Edition, Pearson Education, 2007.

Semester	Branch	Subject & Code	Section	Name of the Staff
III	MCA	10MCA34 DATABASE MANAGEMENT SYSTEM	-	NARERNDRA KUMAR MISHRA Senior Lecturer Dept of MCA

Sl. No,	Topics to be Covered	Period	Remarks
Unit-I – Introduction		09	
1.	Introduction; An example; Characteristics of Database approach;	1.	
2.	Actors on the screen; Workers behind the scene	2.	
3.	Advantages of using DBMS approach; A brief history of database applications; when not to use a DBMS.	3.	
4.	Data models, schemas and instances	4.	
5.	Three-schema architecture and data independence	5.	
6.	Database languages and interfaces	6.	
7.	The database system environment	7.	
8.	Centralized and client-server architectures	8.	
9.	Classification of Database Management systems	9.	
Unit-II - Entity-Relationship Model		09	
10.	Using High-Level Conceptual Data Models for Database Design;	10.	
11.	An Example Database Application	11.	
12.	Entity Types, Entity Sets, Attributes and Keys	12.	
13.	Relationship types, Relationship Sets	13.	
14.	Roles and Structural Constraints; Weak Entity Types	14.	
15.	Refining the ER Design	15.	
16.	ER Diagrams	16.	
17.	Naming Conventions and Design Issues;	17.	
18.	Relationship types of degree higher than two.	18.	

Unit-III - Relational Model and Relational Algebra		10	
19.	Relational Model Concepts	19.	
20.	Relational Model Constraints and Relational Database Schemas	20.	
21.	Update Operations, Transactions and dealing with constraint violations	21.	
22.	Unary Relational Operations: SELECT and PROJECT	22.	
23.	Relational Algebra Operations from Set Theory;	23.	
24.	Binary Relational Operations : JOIN and DIVISION;	24.	
25.	Additional Relational Operations	25.	
26.	Examples of Queries in Relational Algebra	26.	
27.	Relational Database Design Using ER- to-Relational Mapping.	27.	
28.	Relational Database Design Using ER- to-Relational Mapping.	28.	
Unit-IV - SQL		14	
29.	SQL Data Definition and Data Types	29.	
30.	Specifying basic constraints in SQL	30.	
31.	Schema change statements in SQL	31.	
32.	Basic queries in SQL	32.	
33.	More complex SQL Queries	33.	
34.	Insert, Delete and Update statements in SQL	34.	
35.	Specifying constraints as Assertion and Trigger	35.	
36.	Views (Virtual Tables) in SQL	36.	
37.	Additional features of SQL	37.	
38.	Database programming issues and techniques	38.	
39.	Database programming issues and techniques	39.	
40.	Embedded SQL	40.	
41.	Dynamic SQL	41.	
42.	Database stored procedures and SQL / PSM.	42.	

Unit-V – DATABASE DESIGN		08	
43.	Informal Design Guidelines for Relation Schemas	43.	
44.	Informal Design Guidelines for Relation Schemas	44.	
45.	Functional Dependencies	45.	
46.	Normal Forms Based on Primary Keys	46.	
47.	General Definitions of Second and Third Normal Forms	47.	
48.	General Definitions of Second and Third Normal Forms	48.	
49.	Boyce-Codd Normal Form	49.	
50.	Boyce-Codd Normal Form	50.	
Unit-VI – Transaction Management		08	
51.	The ACID Properties	51.	
52.	Transactions and Schedules	52.	
53.	Concurrent Execution of Transactions	53.	
54.	Concurrent Execution of Transactions	54.	
55.	Lock- Based Concurrency Control	55.	
56.	Performance of locking	56.	
57.	Transaction support in SQL	57.	
58.	Introduction to crash recovery	58.	

Text Books

1. **Elmasri and Navathe: Fundamentals of Database Systems**, 5th Edition, Pearson Education, 2007. (Chapters 1, 2, 3 except 3.8, 5, 6.1 to 6.5, 7.1, 8, 9.1, 9.2 except SQLJ, 9.4, 10)

2. **Raghu Ramakrishnan and Johannes Gehrke: Database Management Systems**, 3rd Edition, Tata McGraw-Hill, 2003. (Chapters 16, 17.1, 17.2, 18)

Reference Books:

1. **Silberschatz, Korth and Sudharshan: Data base System Concepts**, 6th Edition, McGrawHill, 2010.

2. **C.J. Date, A. Kannan, S. Swamynatham: An Introduction to Database Systems**, 8th Edition, Pearson Education, 2006.



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Semester	Branch	Subject & Code	Section	Name of the Staff
III	MCA	10MCA35 Operating System	-	Ashwini M B Lecturer Dept of MCA
Sl. No,	Topics to be Covered		Period	Remarks
Unit-I			06	
1.	What operating systems do; Computer System organization; Computer System architecture		1	
2.	Operating System structure; Operating System operations; Process management		2	
3.	Protection and security; Distributed system; Special-purpose systems; Computing environments.		3	
4.	System Services; User - Operating System interface; System calls; Types of system calls		4	
5.	System programs; Operating System design and implementation		5	
6.	Operating System structure; Virtual machines; Operating System generation; System boot.		6	
Unit-II			07	
7.	Process concept; Process scheduling; Operations on processes		7	
8.	Inter-process communication		8	
9.	Multi-Threaded Programming: Overview; Multithreading models; Thread Libraries; Threading issues, . Process Scheduling: Basic concepts		9	
10.	Scheduling criteria		10	
11.	Scheduling algorithms		11	
12.	Multiple-Processor scheduling; Thread scheduling.		13	
Unit-III			07	
13.	Synchronization: The Critical section problem		14	
14.	Peterson's solution		15	
15.	Synchronization hardware		16	
16.	Semaphores		17	

17.	Classical problems of synchronization	18	
18.	Monitors	20	
Unit-IV		06	
19.	Deadlocks: System model	21	
20.	Deadlock characterization	22	
21.	Methods for handling deadlocks	23	
22.	Deadlock prevention;	24	
23.	Deadlock avoidance	25	
24.	Deadlock detection and recovery from deadlock.	26	
Unit-V		07	
25.	Memory Management Strategies: Background; Swapping	27	
26.	Contiguous memory allocation; Paging;	28	
27.	Structure of page table; Segmentation	29	
28.	Virtual Memory Management: Background; Demand paging	30	
29.	Copy-on-write; Page replacement	32	
30.	Allocation of frames; Thrashing.	33	
Unit-VI		07	
31.	File System: File concept; Access methods	34	
32.	Directory structure; File system mounting	35	
33.	File sharing; Protection.	36	
34.	Implementing File System: File system structure; File system implementation	37	
35.	Directory implementation	38	
36.	Allocation methods	39	
37.	Free space management	40	
Unit-VII		06	
38.	Mass storage structures; Disk structure; Disk attachment	41	
39.	; Disk scheduling; Disk management ,Swap space	42	

40.	management.Protection: Goals of protection, Principles of protection,	43	
41.	Domain of protection	44	
42.	Access matrix, Implementation of access matrix, Access control	45	
43.	Revocation of access rights, Capability-Based systems	46	
Unit-VIII		06	
44.	Linux history; Design principles	47	
45.	Kernel modules; Process management	48	
46.	Scheduling; Memory management;	49	
47.	File systems	50	
48.	Input and output	51	
49.	Inter-process communication.	52	

Text Books

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne: Operating System Principles, 8th Edition, Wiley India, 2009.
(Chapters: 1, 2, 3.1 to 3.4 , 4.1 to 4.4, 5.1 to 5.5, 6.1 to 6.7, 7, 8.1 to 8.6, 9.1 to 9.6, 10, 11.1 to 11.5, 12.1 to 12.6, 17.1 to 17.8, 21.1 to 21.9)

Reference Books:

1. D.M Dhamdhare: Operating systems - A concept based Approach, 2nd Edition, Tata McGraw- Hill, 2002.
2. P.C.P. Bhatt: Introduction to Operating Systems: Concepts and Practice, 2nd Edition, PHI, 2008.
3. Harvey M Deital: Operating systems, 3rd Edition, Pearson Education, 1990.