

**NORTH MAHARASHTRA UNIVERSITY,
JALGAON**



**SYLLABUS FOR
T.Y.B.Sc.
Information Technology
(With effect from June 2017)**

North Maharashtra University, Jalgaon
T.Y.B.Sc. (Information Technology)
(w.e.f. June-2017)

Structure

Semester –I	Semester-II
UG-IT-311 System Programming	UG-IT-321 Operating System
UG-IT-312 Database Management System	UG-IT-322 MS SQL Server
UG-IT-313 Data Communication	UG-IT-323 Computer Network & Security
UG-IT-314 Software Engineering	UG-IT-324 Automata Theory, Languages, and Computation
UG-IT-315 Internet Programming using PHP	UG-IT-325 Cyber Law & IT Act
UG-IT-316 JAVA Programming-I	UG-IT-326 JAVA Programming-II
UG-IT-Lab-301 Lab on System Programming	UG-IT-Lab-304 Lab on MS SQL Server
UG-IT-Lab-302 Lab on Internet Programming using PHP	UG-IT-Lab-305 Designing Dynamic Web Portal
UG-IT-Lab-303 Lab on JAVA Programming –I	UG-IT-Lab-306 Lab on JAVA Programming II

Note :-

- 1. Each period is of 48 minutes duration.**
- 2. Each course is of four periods per week**
- 3. Each practical is of four periods per week**
- 4. For each paper 40 marks are for internal assessment and 60 marks are for external.**

Career Opportunities

The career opportunities after B.Sc. (Computer Science) are quite huge. Many major national and multinational firms take in aspirants who have accomplished their graduation in these fields. The top IT firms in India such as Wipro, TCS, and Infosys etc. offer aspirants very attractive packages. Jobs for professionals in these fields can also be got with management consultancy organizations, power plants, Manufacturing plants, Government organizations, Banks and other organizations that use computers and computer-aided systems are but not limited to:

- Programmer or Software Engineer
- Computer Engineer
- Hardware Designer/Engineer
- Systems Engineer, System integrator
- System Administration
- Technical Support
- Support Engineer
- Technical Writer
- Consultant
- Management
- Administration
- IT Sales and Marketing
- IT Officer
- DTP Operator
- Web Designer

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
System Programming (UG-IT-311)
Semester-I

Total lectures: 60

Total Marks: 90

Unit-1 Introduction **[L:06,M:10]**

- 2.1 System Software
- 2.2 Goal of system software
- 2.3 System program and system programming
- 2.4 View of system software

Unit-2 Software Tools **[L:06,M:10]**

- 2.5 What is a Software Tools?
- 2.6 Software Tools for Program Developments
- 2.7 Editors
- 2.8 Debug Monitors
- 2.9 Programming Environments

Unit-3 Overview of Language Processors **[L:10,M:12]**

- 3.1 Programming Languages and Language Processors
- 3.2 Language Processing Activities
- 3.3 Fundamentals of Language Processing

Unit-4. Assembler **[L:12,M:16]**

- 4.1 Definition.
- 4.2 Features of assembly language, advantages
- 4.3 Statement format, types of statements
- 4.4 Constants and Literals.
- 4.5 Advanced assembler directives
- 4.6 Design of assembler – Analysis Phase and Synthesis Phase.
- 4.7 Overview of assembly process
- 4.8 Pass Structure of Assembler – One pass, two pass assembler.
- 4.9 Problems of One-pass assembler
- 4.10 Design of Two-pass Assembler

Unit-5. Macro and Macro Preprocessor **[L: 08,M:14]**

- 5.1 Macro Definition and Call
- 5.2 Macro Expansion
- 5.3 Nested Macro Calls
- 5.4 Tables used in Macro
- 5.5 Advanced Macro Facilities
- 5.6 Design of Macro Preprocessor

Unit-6. Compiler**[L:12,M:14]**

- 6.1. What is Compiler
- 6.2. Scanning and Parsing
 - 6.2.1. Programming Language Grammars
 - 6.2.2. Scanning
 - 6.2.3. Parsing
- 6.3. Language Processors Development Tools

Unit-7. Linkers and Loaders**[L:06,M:14]**

- 7.1 Introduction
- 7.2 Relocation and Linking Concepts
- 7.3 Self Relocating Programs
- 7.4 Linking for Overlays
- 7.5 Dynamic Linking
- 7.6 Loaders

References:

1. D.M. Dhamdhere, “Systems Programming”, ISBN : 9780071333115, Tata McGraw-Hill Education ,2011
2. D.M. Dhamdhere, “Systems programming and operating system”. ISBN: 978-0074635797, Tata Mcgraw Hill Education Private Limited
3. John Donovan, “System programming.”, ISBN: 978-0-07-460482-3, Tata Mcgraw Hill Education Private Limited
4. Alfred V Aho, Ravi Sethi, Jeffery D. Ullman, “ Compilers Principals and tools” , ISBN: 81-7808-046-X , Pearson education, Delhi, 2008.

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
UG-IT 312 Database Management System
Semester I

Total lectures: 60
Total Marks: 90

- 1. Introduction of DBMS** **L 12: M 16**
- 1.1. Overview, Definition
 - 1.2. Types of DBMS
 - 1.3. Describing & storing data (Data models (relational, hierarchical, network)),
 - 1.4. Levels of abstraction, data independence,
 - 1.5. Queries in DBMS (SQL: DDL, DML, DCL, TCL), Users of DBMS,
Advantages of DBMS
- 2. Conceptual Design (E-R model)** **L 12 : M 16**
- 2.1. Overview of DB design,
 - 2.2. ER data model (entities, attributes, entity sets, relations, relationship sets) ,
 - 2.3. Conceptual design using ER (entities VS attributes, Entity Vs relationship,
Binary Vs ternary)
- 3. Relational data model** **L 12 : M 18**
- 3.1. Relations (concepts, definition),
 - 3.2. Conversion of ER to Relational model,
 - 3.3. Integrity constraints (key, referential integrity, general constraints)
 - 3.4 Codd's Rules, Functional Dependency, Data Normalization (1NF, 2NF, 3NF, BCNF)
- 4. Relational algebra** **L 08 : M 15**
- 4.1. Preliminaries
 - 4.2. Relational algebra (selection, projection, set operations, renaming, joins, division)
- 5. Database Implementations** **L-08 M:12**
- Database security, Database integrity, Transaction Concept, Transaction State, Transaction Properties (ACID)
- 6. Concurrency control, Backup & recovery:-** **L-08 M-12**
- Lock-Based protocol, Timestamp-Based protocol, Log base Recovery, Shadow Paging, and Differed Updates.

Reference Books:-

1. Abraham Silberschatz , Henry F. Korth & S.Sudarshan, "Database System Concepts" , ISBN 0-07-228363-7, McGraw- Hill, 4th Edition .
2. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", ISBN: 978-0136086208 Sixth Edition, Pearson Education.
3. Alexis Leon & Mathews leon , "Database System Concepts" , ISBN: 9788182092228 Vikas Publication House Ltd, New Delhi.

North Maharashtra University, Jalgaon
T.Y.B.Sc. Information Technology
(w.e.f. June 2017)
Data Communication (UG-IT-313)
Semester-I

Total lectures: 60

Total Marks: 90

Unit 1 Fundamentals of Communication

L-12 M- 12

1.1 Concept of data communication

1.1.1 Transmission Characteristics

1.1.2 Asynchronous & Synchronous Transmission

1.2 Basic terms & concepts

1.2.1 Messages, Headers & Codes

1.2.2 Session & Communication model – Encoder, Channels, Decoder,
Signal Processing

Unit 2. Major Communication in data communication system

L-10 M- 17

2.1 Transmission Path

2.1.1 Twisted Pair Cable

2.1.2 Co-axial Cable

2.1.3 Submarine Cable

2.1.4 Optical Fibers

2.1.5 Comparison of Wire Pair & Co-axial Cable

2.1.6 Satellite Communication & Microwaves

2.2 Modems

2.2.1 Modulation Technique

2.2.2 Amplitude Modulation

2.2.3 Phase Modulation

2.2.4 Frequency Modulation

2.2.5 Pulse Code Modulation

Unit 3. Switching & Multiplexing

L-10 M- 17

3.1 Switching

3.1.1 Circuit Switching

3.1.2 Message Switching

3.1.3 Packet Switching

3.2 Multiplexing & de-Multiplexing

3.2.1 Line Sharing & Compression

3.2.2 Concentrators

3.2.3 Data Compression

Unit 4. Error Correction & Detection

L-12 M- 17

4.1 Types of Errors

4.1.1 Single-Bit Error

4.1.2 Burst Error

4.2 Error Detection

4.2.1 Redundancy

4.2.2 Parity Check

4.2.3 Cyclic Redundancy Check (CRC)

4.2.4 Checksum

4.3 Error Correction

4.3.1 Hamming Cod

Unit 5. Wired and Wireless LANs

L-13 M- 17

5.1 Wired LAN

5.1.1 ETHERNET Protocol

- IEEE Project 802
- ETHERNET Evolution
- Standard ETHERNET

5.2 Wireless LAN

5.2.1 Introduction

- Architectural Comparison
- Characteristics
- Access Control

5.2.2 IEEE 802.11 Project

- Architecture

5.3 Bluetooth

5.3.1 Architecture

5.3.2 Application

Unit 6. Data Communication Services

L-5 M- 10

5.1 Switched Multi megabit Data Service

5.2 X.25 N/W

5.3 Frame Relay

References:

1. Andrew S.Tanenbaum , “Computer Networks “ ISBN: 978-0130661029, Prentice Hall, Fourth Edition .
2. Behrouz A. Forouzan , “Data Communication & Networking”, ISBN: 978-0071232418 , McGraw Hill Higher Education , Third Edition
3. 3.U.D. Black , “Data Communication & Distributed Networks”, ISBN: 9780835913416, Published by Prentice-Hall, Englewood Cliffs, N.J., 1987 , Second Edition ,

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
Software Engineering (UG-IT-314)
Semester-I

Total lectures: 60

Total Marks: 90

L-10 M-12

1. Introduction to Software Engineering:

- 1.1 Software and Software Engineering
- 1.2 Evolution of Software
- 1.3 Software Characteristics
- 1.4 Software Applications
- 1.5 Software Myths
- 1.6 Software Process
- 1.7 Software Development Life Cycle (SDLC)

L-12 M-14

2. Software Development Model:

- 2.1 Waterfall Model
- 2.2 Prototyping Model
- 2.3 Incremental Development Model
- 2.4 RAD model
- 2.5 Spiral Model

L-10 M-12

3. Requirement Analysis and Specification:

- 3.1 Requirements Engineering
- 3.2 Fact finding Techniques
- 3.3 Introduction to Types of Requirement Modeling
- 3.4 Data Modeling Concepts- Data Objects, Data Attributes & Relationship.

L-10 M-14

4. Design Engineering:

- 4.1 Characteristics of good Software Design
- 4.2 Design Concepts- Architecture, Modularity, Information Hiding
- 4.3 Cohesion & Coupling
- 4.4 Decision Table & Decision Tree
- 4.5 Data flow Diagram
- 4.6 Data Dictionary

L-8 M-12

5. Software Coding & Testing:

- 5.1 Coding standards & Guidelines
- 5.2 What is testing?
- 5.3 Testing Activities
- 5.4 Black box testing
- 5.5 White box testing
- 5.6 Introduction to Debugging Approaches – Brute force Method, Backtracking, Case Elimination Method, Programming Slicing.

6. Software quality:

L-10 M-12

6.1 What is Quality?

6.2 Software Quality - Garvin's quality dimensions, Mc Calls quality factors, ISO 9125 quality factors

6.3 Elements of Software Quality Assurance

6.4 ISO 9000 & Certification

References –

1. Roger S.Pressman , “Software Engineering a Practitioners Approach”, ISBN 13: 9780071267823, 7th edition, McGraw Hill International Edition.
2. Rajib Mall , “Fundamental of Software Engineering”, ISBN- 978-81-203-3819-7 3RD Edition, , PHI Learning Private Limited.

North Maharashtra University, Jalgaon

**T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)**

**Internet Programming using PHP (UG-IT-315)
Semester I**

Total lectures: 60

Total Marks: 90

Unit – 1 The Basics of PHP

L:16 M:24

- 1.1 Introduction to PHP
- 1.2 Features & Drawbacks of PHP, How PHP Works?
- 1.3 Version of PHP
- 1.4 Lexical Structure of PHP
 - 1.4.1 Structure & Syntax of PHP
 - 1.4.2 PHP with HTML
 - 1.4.3 Comments
 - 1.4.4 Data Types and Variables
 - 1.4.5 Operator
- 1.5 Flow Control Statements
 - 1.5.1 Conditional Statements
 - 1.5.2 Looping Statements
 - 1.5.3 Exit, Return, Die, Include and Require Statements

Unit – 2 Array, Function and String

L:12 M:20

- 2.1 Introduction to Array
 - 2.1.1 Index Vs Associative Array
 - 2.1.2 Multidimensional Array
 - 2.1.3 Different array function in PHP
- 2.2 Introduction to Function
 - 2.2.1 Defining and Calling a function
 - 2.2.2 Scope of variables in function
 - 2.2.3 Function Parameters
 - 2.2.4 Returning Values from a function
 - 2.2.5 Recursive Functions
- 2.3 Types of strings in PHP
- 2.4 Printing functions
- 2.5 Comparing strings
- 2.6 Manipulating and Searching strings
- 2.7 Regular Expressions

Unit – 3 Object-Oriented PHP

L:12 M:16

- 3.1 Introduction and Benefits of OOPs
- 3.2 Creating a Class
- 3.3 Creating an Object
 - 3.3.1 Adding a Method
 - 3.3.2 Adding a Properties
 - 3.3.3 Visibility (Public, Private and Protected)
- 3.4 Constructor and Destructors
- 3.5 Inheritance (Extending a class)

- 3.6 Abstract classes, Final classes
- 3.7 Interfaces
- 3.8 Exception handling

Unit – 4 Web Techniques

L:10 M:14

- 4.1 Introduction
- 4.2 HTTP Basics
- 4.3 Processing Forms
 - 4.3.1 Methods (Get and Post Method)
 - 4.3.2 Parameters (\$_GET and \$_POST)
 - 4.3.3 Self Processing Pages
 - 4.3.4 File Uploads
- 4.4 Maintaining State
 - 4.4.1 Cookies
 - 4.4.2 Sessions
 - 4.4.3 Combining Cookies and Sessions

Unit – 5PHP with MySQL

L:10 M:14

- 5.1 Introduction to MySQL
- 5.2 Interaction between PHP and MySQL, PHP functions to manipulate MYSQL database
- 5.3 Error Checking
- 5.4 Execute DDL Statements
- 5.5 Execute DML Statements

References Books:

1. RasmusLerdorf and Kevin Tatroe, “ Programming PHP” ,ISBN: 978-1-56592-610-3, O'Reilly publication,2002
2. Dave W. Mercer, Allan Kent, “Beginning PHP 5” ,ISBN: 978-0-7645-5783-5, Wrox publication , July 2004.
3. W. Jason Gilmore , “Beginning PHP and MySQL”,ISBN: 978-1-4302-3115-8, 3rd edition, Apress Publication.
4. Ivan Bayross and Sharnam Shah , “PHP 5.1 for Beginners”, ISBN: 9788184040753 SPD Publication 2007

Websites:

1. <http://www.php.net.in>
2. <http://www.w3schools.com>
3. <http://www.tutorialpoints.com>

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
JAVA Programming I (UG-IT-316)
Semester-I

Total lectures: 60
Total Marks: 90

Unit 1. INTRODUCTION TO JAVA

L-14, M-18

- 1.1 Features of Java.
- 1.2 Java and Internet,
- 1.3 JDK Environment (Java, Javac, Applet Viewer, Javadoc),
- 1.4 Basics of Java- Variables, Data Types, Casting, Operators, Compiling and running java program, Command line arguments.
- 1.5 Arrays

Unit 2. OBJECTS AND CLASSES

L-10, M-14

- 2.1 Introduction – Classes and Objects
- 2.2 Types of Constructors
- 2.3 Overloading
- 2.4 Packages
- 2.5 Access modifier
- 2.6 Abstract Class.

Unit 3. FUNCTIONS IN JAVA

L-08, M-14

- 3.1 String functions - Concatenation, Substring, String editing, Testing for Equality,
- 3.2 character extraction functions – CharAt, getChars, getByte ,
- 3.3 Formatting functions,
- 3.4 Date and Time functions using Gregorian Calendar Class.

Unit 4. INHERITANCE

L-12, M-20

- 4.1 Inheritance- Inheritance Hierarchy, Super class, Overriding, Polymorphism,
- 4.2 Wrapper classes,
- 4.3 Reflection - 'Class' class,
- 4.4 Interfaces
- 4.5 Inner classes

Unit 5. EXCEPTION HANDLING

L-08, M-10

- 5.1 Dealing with errors - Types of exceptions
- 5.2 How to throw the Exception
- 5.3 Catching Exceptions.

Unit 6. STREAMS & FILES

L-08, M-12

- 6.1 Streams- Stream family - Layering stream files, Data stream,
- 6.2 Random access file stream,
- 6.3 String Tokenizers
- 6.4 Object streams.

References:-

1. Cay's Horstmann and Gary Cornell, "Core Java Volume -1 Fundamentals", ISBN: 81-7808-277-2
2. E. Balaguruswamy, "Programming with Java – A primer", ISBN: 978-0-07-061713-1
3. Herbert Schildt, "The complete reference JAVA-2", ISBN: 978-0-07-049543-2, Fifth Edition, (TMH)
4. Kogent Solution Inc., "Java 6 Programming Black Book", ISBN: 978-8177227369, Dreamtech Press.

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
LAB on System Programming
(UG-IT-LAB-301)

Semester-I

1. To create line editor with features like create a new file, open existing file, Append in the file, Save and print file as well as to insert, delete, copy & move Lines in the file.
2. Write a program to isolate each lexical unit of source program statement and Create Descriptor.
3. Write lexical analyzer to remove blanks and tabs.
4. Write lexical analyzer to deleting comments.
5. Simulate CPU for SMAC0 (Small Computer)
6. SMAC0 Programming:-
 1. Addition of two numbers
 2. Subtraction of two numbers,
 3. Multiplication of two numbers
 4. Division of two numbers
 5. Find MOD
 6. GCD of two numbers
 7. LCM of two numbers
 8. Factorial of given number
 9. Square & Cube of given number.
 10. Fibonacci series
(Do not use op-codes for MULT, MOD and DIV operation)
7. Interrupt handler in C
(Keyboard interrupt should be disabled and alt-C should be used to toggle CAPS Lock and alt-N should be used to toggle NUM lock)

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
UG-IT-LAB-302

Lab on- Internet Programming using PHP

Semester-I

1. Design web pages using HTML that will contain online admission forms.
2. Write PHP scripts that demonstrate fundamentals PHP.
3. Write PHP script that will display grade based on criteria given below using the marks obtained in T.Y.Bsc. Examination.
 - a. Distinction (70 and above)
 - b. First Class (60 - 69)
 - c. Pass (40 - 59)
 - d. Fail (below 40)
4. Write a PHP script to demonstrate different String functions.
5. Write a PHP script to demonstrate array functions.
6. Write a PHP script to use Functions (Call by Value, Call by reference).
7. Write a PHP script to Demonstrate OOPS Concept in PHP.
8. Write a PHP script to demonstrate Exception Handling.
9. Write a PHP script to demonstrate Form Data Handling using Get and Post methods.
10. Design a database in MYSQL using PHP. Create table in database. Store, Update, Delete and Retrieve data from the table. Display the data from the table.
11. Write a PHP script to store, retrieve and delete cookies on your local machine.
12. Write a PHP script to store, retrieve and delete data using session variables.

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
JAVA Programming-I
(UG-IT-LAB-303)

Semester – I

1. Write a simple program in Java to print first fifty prime number.
2. Write a program in Java to print factorial of given number using recursion
3. Write a program in Java to print Fibonacci series in given series
4. Write a program in Java to demonstrate command line arguments.
5. Write a program in Java to create student information using array
6. Write a program in Java to implement user defined package.
7. Write a program in Java to implement default & parameterized constructor.
8. Write a program in Java to demonstrate various operations on string functions.
9. Write a program in Java to demonstrate wrapper classes
10. Write a program in Java to demonstrate abstract class.
11. Write a program in Java to implement inheritance.
12. Write a program in Java to demonstrate inner class.
13. Write a program in Java to demonstrate reflection.
14. Write a program in Java to demonstrate exception handling.
15. Write a program in Java to demonstrate text stream object that take input from user & write it into text file.

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
Operating System (UG-IT-321)
Semester-II

Total lectures: 60
Total Marks: 90
L:06M:08

Unit 1.Introduction

- 1.1 What is an operating system?
- 1.2 Types of Operating System
- 1.3 Services of Operating System
- 1.4 Functions of operating system.

Unit 2.CPU scheduling

- 2.1 Multiprogramming Concepts
- 2.2 Basic Concept of CPU scheduling
- 2.3 Scheduling Algorithms

Unit 3.Memory Management

- 3.1 Logical versus Physical Address space
- 3.2 Swapping
- 3.3 Multiple partition allocation MFT , MVT
- 3.4 Paging
- 3.5 Segmentation

Unit 4. Disk and Drum Scheduling

- 4.1 First Come first serve scheduling
- 4.2 Shortest Seek Time First Scheduling
- 4.3 SCAN Scheduling
- 4.4 C-SCAN Scheduling

Unit 5 Deadlocks

- 5.1 Concept of Deadlock
- 5.2 Deadlock Characterization
- 5.3 Deadlock Prevention
- 5.4 Deadlock Avoidance
- 5.5 Deadlock Detection
- 5.6 Recovery from Deadlock

Unit 6 Overview of Android Operating system

- 6.1 What is android operating system.
- 6.2 Android Architecture
- 6.3 Features of Android operating system
- 6.4 Applications of android operating system
- 6.5 What is Google play store

Reference books:

1. Peterson Silberschatz, "Operating system concepts", ISBN: 0-201-35251-6, Addison Wesley, 1ST Edition
2. Andrew S. Tanenbaum, "Modem operating system", ISBN: 81-203-0974-X, P .H.I. New Delhi 3.
3. Achyut S. Godbole, "Operating Systems" ISBN: 9780070702035, McGraw Hill Education, 2010, Third Edition
4. .Marko Garaenta, "Learning Android ,Oreilly ", ISBN: 978-1449319236, O'Reilly, second edition
5. 5 Mike Wolfson, "Android developers tools ,Essential,Oreilly" ISBN:978-1-4493-2821-4

North Maharashtra University, Jalgaon

T. Y. B. Sc. (Information Technology)

(w.e.f. June -2017)

UG-IT 322 MS SQL Server

Semester II

Total lectures: 60

Total Marks: 90

[L: 10 M: 12]

Unit 1 INTRODUCTION TO SQL and MS SQL Server

Introduction to SQL

Overview of MS SQL Server ,

New Features in MS SQL Server ,

Data types in MS SQL Server

MS SQL Server 2008 Editions

Unit 2 DATABASE AND TABLE OPERATIONS

[L: 06 M: 10]

Database Operations - 1.Creating a Database 2.Dropping the Database

Table Operations – 1.Create 2. Alter 3.Truncate 4. Drop

Unit 3 SQL – Statements, Operators, Functions.

[L: 10 M: 16]

Opening the Query Editor Window

SQL Data Statements - SELECT, INSERT, UPDATE, DELETE

Operators - Arithmetic, Logical, Comparison, Assignment, Bitwise, Relational

String - Concatenation, Unary, Compound Assignment

Functions - Aggregate functions, Date and Time functions, String functions

Control -Control Flow Statements, BEGIN...END, GOTO, IF...ELSE, WHILE

Unit 4 VIEW, JOIN and DATA CONSTRAINTS in SQL

[L: 10 M: 16]

Constraints - Data Integrity, Entity Integrity

Keys - PRIMARY KEY, UNIQUE, FOREIGN KEY, CHECK

Views - Create, Alter, Drop

Join - Joins, Cross Join, Inner Join, Outer Join, Self-Join

Statement - MERGE Statement

Unit 5 STORED PROCEDURES

[L : 10 M: 14]

Benefits of Stored Procedures

Types of Stored Procedures - System Stored Procedures, User-Defined Stored Procedures

Creating and Altering Stored Procedure

Indexing:-Creating an Index, Optimizing the Index Performance, Removing the Index

Unit 6 TRIGGERS

[L: 06 M: 10]

Introduction, Triggers Vs constraints, DML Triggers, DDL Triggers

Unit 7 ERROR HANDLING

[L : 07 M: 10]

Introduction Error Handling,

Function: - Using the @@ERROR Function,

Statement: - RAISERROR, TRY...CATCH Statement

REFERENCE BOOKS:

1. Kogent Learning Solutions Inc. (Author), “ Simple Steps in MS SQL Server 2008”, ISBN: 978-8177229554, Dreamtech press 2009.
2. Danielle Ruest and Nelson Ruest, ” MS SQL Server 2008, The complete Reference” ISBN: 978-0072263657, McGraw-Hill Education; 1 edition.
3. MS SQL Server – Black Book”, Dalton Patrik, DreamTech Press

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
Computer Network and Security (UG-IT-323)
Semester II

Total lectures: 60
Total Marks: 90

Unit 1. Introduction

L-10 M- 15

- 1.1. Application of Network
- 1.2. Network Structures
 - 1.2.1. Point-to-point Channel
 - 1.2.2. Broadcast Channel
 - 1.2.3. Topologies - Star, Tree, Bus, Ring, Mesh, Fully Connected.
- 1.3. Protocol Hierarchy
 - 1.3.1. Layers, Protocols & Interfaces
 - 1.3.2. The OSI and TCP/IP Reference Model

Unit 2. The Physical Layer

L-8 M- 12

- 2.1. The telephone System
 - 2.1.1. ISDN – Introduction & Architecture
- 2.2. Wireless Transmission
 - 2.2.1. Electromagnetic Spectrum
 - 2.2.2. Radio Transmission
 - 2.2.3. Microwave Transmission
 - 2.2.4. Infrared & Millimeter Waves
 - 2.2.5. Light wave Transmission

Unit 3. The Data link Layer

L-12 M- 18

- 3.1. Design Issues of DLL
 - 3.1.1. Services Provided to Network Layer
 - 3.1.2. Framing
 - 3.1.3. Error Control & Flow Control
- 3.2. Elementary Data Link Protocol
 - 3.2.1. An Unrestricted Simplex Protocol
 - 3.2.2. A Simplex Stop & Wait Protocol
- 3.3. Sliding Window Protocol
 - 3.3.1. One Bit Sliding Window Protocol
 - 3.3.2. Protocol Using Go-Back N

Unit 4. The Network Layer

L-10 M- 18

- 4.1 Logical Addressing
 - 4.1.1 IP v4 Addresses
 - Address Space
 - Classful Addressing
 - Classless Addressing
 - 4.1.2 IP v6 Addresses

- Representation
- Address Space
- 4.1.3 Comparison between IPv4 and IPv6
- 4.2. Routing Algorithm
 - 4.2.1. Shortest Path
 - 4.2.2. Multicast Routing
- 4.3. Congestion Control
 - 4.3.1. Introduction to Congestion Control
 - 4.3.2. Deadlocks

Unit 5. Network security

L-10 M-15

- 5.1 Firewalls: concept, design principles, limitations
- 5.2 IP security:
 - 5.2.1 Overview, architecture, IPSec, IPSec configurations, IPSec security
- 5.3 Virtual Private Network
- 5.4 Email security:
 - 5.4.1 Email security standards: Working principle of SMTP, PEM, PGP, S/MIME, spam

Unit 6. Cryptography

L-10 M-12

- 6.1 Introduction
 - 6.1.1 Security Goals
 - 6.1.2 Attacks
 - 6.1.3 Services and Techniques
- 6.2 Confidentiality
 - 6.2.1 Symmetric Key Cipher
 - 6.2.2 Asymmetric Key Cipher

References:

1. Andrew S.Tanenbaum , “Computer Networks “ ISBN: 978-0130661029, Prentice Hall, Fourth Edition .
2. Behrouz A. Forouzan , “Data Communication & Networking”, ISBN: 978-0071232418 , McGraw Hill Higher Education , Third Edition
3. 3.U.D. Black , “Data Communication & Distributed Networks”, ISBN: 9780835913416, Published by Prentice-Hall, Englewood Cliffs, N.J., 1987 , Second Edition ,

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
Automata Theory, Languages, and Computation (UG-IT-324)
Semester-II

Total lectures: 60
Total Marks: 90
[L-06 M-10]

Unit-1. Introduction

- 1.1 Symbol, Alphabet, String, Formal Language, Operation on languages
- 1.2 Sets, Relations
 - 1.2.1 Sets and Subsets
 - 1.2.2 Relations
 - 1.2.3 Closure of Relations
- 1.3 Graphs & Trees
 - 1.3.1 Graphs
 - 1.3.2 Trees
- 1.4 Principle of Induction

Unit-2. Finite Automata

[L-16 M-22]

- 2.1 Definition of Automata
- 2.2 Description of Finite Automata, Transition Systems, Transition Functions
- 2.3 Deterministic Finite Automata (DFA)
- 2.4 Nondeterministic Finite Automata (NFA)
- 2.5 The Equivalence of DFA and NFA
- 2.6 Finite Automata with ϵ -Moves
- 2.7 Minimization of Finite Automata
- 2.8 Applications of Finite Automata

Unit-3. Regular Expressions & Regular Sets

[L-12 M-16]

- 3.1 Define Regular Expression and Regular Set
- 3.2 FA & Regular Expressions
 - 3.2.1 Convert Regular Expression to FA
 - 3.2.2 Construct FA from Regular Expression
- 3.3 Pumping Lemma for Regular Sets and applications

Unit-4. Context Free Grammars

[L-10 M-18]

- 4.1 Introduction to Context Free Grammars
- 4.2 Derivation Trees
 - 4.2.1 Ambiguity in CFG
- 4.3 Simplification of Context Free Grammars
 - 4.3.1 Useless Symbols
 - 4.3.2 ϵ - Production
 - 4.3.3 Unit Production
- 4.4 Normal forms for CFG
 - 4.4.1 Chomsky Normal Form (CNF)
 - 4.4.2 Greibach Normal Form (GNF)

Unit-5 Pushdown Automata**[L-08 M-12]**

- 5.1 Pushdown Automata Model
- 5.2 Acceptance by Pushdown Automata
- 5.3 PDA and Context Free Language

Unit-6 Turing Machine**[L-08 M-12]**

- 6.1 Turing Machine Model
- 6.2 Representation of Turing Machine
- 6.3 Design of Turing Machine

References:

1. John E. Hopcraft, Rajeev Motwani, Jeffery D. Ullman, "Introduction to Automata Theory, Languages & Computations", ISBN: 978-0321455369 , Pearson publication, Third edition
2. K. L. P. Mishra, N. Chandrasekaran, "Theory of Computer Science", ISBN: 9788120329683 , Published by Prentice-Hall of India Pvt.Ltd , Third edition.
3. Daniel A. Cohen, "Introduction to Computer Theory", ISBN: 978-0471137726, John Wiley & Sons; 2nd Revised edition edition.

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
Cyber Law and IT ACT (UG-IT-325)
Semester-II

Total lectures: 60

Total Marks: 90

Unit 1. Basic Terms and Introduction

L-12 M-15

- 1.1 Cyber world, Cyber Space, Cybernetics, Electronic Data Interchange (EDI).
- 1.2 E–governance, E–commerce.
- 1.3 B2B, B2C, & C2B, C2C, G2B (Government to Business), G2C (Government to Citizens)

Unit 2. Cyber Crime

L-12 M-15

- 2.1. Concept of Cyber Crimes – Categories of cyber crime, Types of Cyber crimes.
- 2.2 Viruses, worms, software piracy.
- 2.3 Web jacking, Web Defacement, Cyber Stalking, Cyber Pornography.
- 2.4 Hacking, Phishing, e-fraud, threatening email, Cyber Terrorism.

Unit 3. Cyber Laws and Security

L-12 M-20

- 3.1 Introduction to Cyber Law
- 3.2 Definition, Objective of Cyber Law – Need and Scope
- 3.3 Copyright issues in Cyberspace, Data encryption, Cryptography, Digital Signatures.
- 3.2 Password, Encrypted smart card, Bio-metric, firewall.
- 3.3 Information Security Management System and other Security Compliances.

Unit 4. Information Technology Act

L-12 M-20

- 4.1. Background of Information Technology Act 2000
- 4.2. Preliminary, Definitions, amendments.
- 4.3 Authentication of electronic records, Legal recognition of electronic records.
- 4.4 Legal recognition of digital signatures, Attribution, Regulation of Certifying Authorities.
- 4.4. Acknowledgment and Dispatch of electronic records.
- 4.5. Secure records and secure digital signatures,
- 4.6. Functions of controller, Duties of Subscribers, Penalties and Offences.

Unit 5. Intellectual Property Rights

L-12 M-20

- 5.1 Introduction
- 5.2 Objective of copyright
- 5.3 Requirement and meaning of copyright
- 5.4 Copyright as bundle of rights, Framing
- 5.5 Linking and infringement
- 5.6 Information technology act related to copyright

Reference Books:

- 1) Cyber Laws Dr Gupta & Agrawal , Premier publishing Company
- 2) Vivek Sood , “Cyber Law simplified”, ISBN: 9780070435063,Tata MaGraw-Hill
- 3) S.R. Sharma , “Nature of Cyber Laws”, ISBN: 9788126115402, Anmol Publications
- 4) S.R. Sharma , “Dimensions of Cyber Crime”,ISBN: 9788126115419 , Anmol PuLications

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
JAVA Programming II (UG-IT-326)
Semester-II

Total lectures: 60
Total Marks: 90
L-07, M-13

Unit- 1. APPLETS

- 5.1 Applet basics -Simple applets, testing applets,
- 5.2 Security basic,
- 5.3 Converting application to applets,
- 5.4 Life cycle of applet
- 5.5 Param Tag

Unit-2. GRAPHICS PROGRAMMING

L-10, M-14

- 1.1 Introduction- frames, frame layouts,
- 1.2 Displaying information in a frame, Graphics objects and paint component method,
- 1.3 Text and Fonts,
- 1.4 Colors,
- 1.5 Drawing Shapes, Filling Shapes,
- 1.6 Paint mode and Images.

Unit-3. EVENT HANDLING

L-14, M-16

- 2.1 Basic Event Handling,
- 2.2 The AWT event hierarchy,
- 2.3 event handling summary- event sources and listener, adapter classes.
- 2.4 low level events - Focus, window, keyboard, mouse events.
- 2.5 Multicasting

Unit-4. USER INTERFACE COMPONENTS USING SWING

L-12, M-18

- 3.1 Introduction to layout management - FlowLayout, Border Layout, Grid Layout,
- 3.2 Text Input- Text Field, Text Area, Password field
- 3.3 Labels, Borders and BorderFactory, Buttons
- 3.4 Making choices - Check boxes, Radio buttons, List, Combo boxes

Unit-5. Menu and Dialog Box

L-10, M-14

- 4.1 Menus - Building menus
- 4.2 Menu events,
- 4.3 Popup menu,
- 4.4 Keyboard mnemonics and Accelerators, enabling and disabling menus
- 4.5 Dialog boxes - opening dialogs using inbuilt dialog box

Unit- 6. INTRODUCTION TO ADVANCED JAVA

L-07,M-13

- 6.1 Collections
 - 6.1.1 Interfaces- List, Set,
 - 6.1.2 Classes- Array List, Vector
- 6.2 Database connectivity –JDBC
- 6.3 Introduction to JavaBeans- Servlets, Java Server Pages (JSP),CORBA.

References:-

1. Cay's Horstmann and Gary Cornell , "Core Java Volume 2", ISBN: 978-0-13-708160-8, 9TH edition, published by Prentice Hall
2. E. Balaguruswamy , "Programming with Java – A primer", ISBN: 978-0-07-061713-1
3. Herbert Schildt, "The complete reference JAVA-2", ISBN: 978-0-07-049543-2, Fifth Edition, (TMH)
4. Kogent Learning Solutions Inc, "Java Programming Black Book", ISBN: 978-9351190820, Dreamtech Press.
5. Buyya, Selvi, Chu, , "Object Oriented Programming with Java", ISBN: 978-0070678835, Tata McGraw Hill Education 2010

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
LAB on MS SQL Server 2008
(UG-IT-LAB-304)

Semester-II

1. Demonstration of creating database and table and use of DML statements.
 - i. Create and Alter Database
 - ii. Create, Alter and Drop Table
 - iii. Select, Insert, Update, Delete, Group By, Having etc. Statements
 - iv. Use of Functions – Group, String, Mathematical, Date
2. Defining different types of database constraint.

Create Table using Primary, Foreign, Unique keys, Check Constraints, Not Null, Constraints - using single and multiple tables.
3. SQL : Simple, Sub query ,Join and Operators
 - i. Write Simple Queries
 - ii. Use of Logical operators like Between, Like, Any, In, Some, ALL ,AND,OR,NOT
 - iii. Use of Merge, Index statement
 - iv. Cross, Inner, Outer and Self Join
 - v. Create, Alter and Drop View
4. Demonstration of stored procedures and triggers
 - i. Create and Alter Stored Procedure using INPUT , OUTPUT & TABLE Valued parameters
 - ii. Creating DML & DDL triggers
5. Demonstrate the Use of @@error & RAISERROR
 1. Use of @@error by error numbers : 515,2627 and 547
 2. Use of TRY..CATCH statement

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
Lab on - Developing Mini Dynamic Web Portal
UG-IT-LAB- 305

Semester-II

1. Student has to develop a web portal in CMS(Content Management System).
2. Introduction of CMS (including WordPress, Drupal and Joomla)
3. Student should know:
 - Installing XAMP (Local Web Server)
 - Working with XAMP control panel.
 - Setting up of MYSQL database
 - Installation of WordPress software
4. Working with WordPress:
 - Exploring the WordPress Dashboard
 - About media Library
 - Installation of wordPress themes
 - Installation of wordpress plugins
 - Creating a Blog and Post
5. Creating a Web Portal .

While developing Web portal student should follow following guidelines

1. Student has to develop a web portal as laboratory assignment.
2. Web portal should be developed in laboratory under supervision of instructor.
3. One Web portal per student.
4. Web portal title must be unique.
5. Duration of Web portal development will be full semester.
6. Web portal documentation must be filed properly.
 - Reporting specifications are – Font size 12, Name – Times New Roman, Spacing 1.5 with header and footer.
7. Evaluation of Web portal will be done as per laboratory evaluation.
8. Student has to demonstrate Web portal at the time of examination.
9. Student should be able to modify web portal at the time of examination.
10. Report Structure
 - Introduction
 - Background
 - Analysis and Design
 - Implementation
 - Testing
 - Results
 - Conclusion, Evaluation and Further Work

(**Note :** For final practical examination demo for developed web portal is compulsory and one web page will be given for development)

North Maharashtra University, Jalgaon
T. Y. B. Sc. (Information Technology)
(w.e.f. June -2017)
LAB on JAVA Programming – II
(UG-IT-LAB-306)
Semester-II

1. Write a program in Java to display messages in various fonts in a frame
2. Write a program in Java to draw various geometric shapes like circle, line, rectangle etc.
3. Write a program in Java to demonstrate paint mode.
4. Write a program in Java to demonstrate window events.
5. Write a program in Java to demonstrate Mouse events.
6. Write a program in Java to demonstrate Keyboard events.(key pressed, key released)
7. Write a program in Java to demonstrate multicasting
8. Write a program in Java to demonstrate user interface component list boxes and combo box.
9. Write a program in Java to demonstrate user interface component radio button and check box.
10. Write a program in Java to demonstrate menus as interface component.
11. Write a program in Java to demonstrate multithreading.
12. Write an Applet to display human face.
13. Write a program in Java to demonstrate Java Applet with parameter
14. Write a program in java to demonstrate collection interfaces. (List and Set).