SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

Syllabus of B.Sc.(IT) (Bachelor of Information Technology)

B.Sc.(IT) Third Year (Semester-5)

Code No.	Subject Title	Teaching Period/ Week Theory	Practical	Maximum Marks A	Internal Test Marks B	Total Marks (A+B)	Duration of Exam Hours
SEMESTER-5							
B.Sc.ITS5.01	Java Programming	4	-	80	20	100	3
B.Sc.ITS5.02	Linux Operating System	4	-	80	20	100	3
B.Sc.ITS5.03	TCP/IP	4	-	80	20	100	3
B.Sc.ITS5.04	Computer System Security	4	-	80	20	100	3
B.Sc.ITS5.PR1	Comp Lab1 Java Programming	-	3	80	-	50	3
B.Sc.ITS5.PR2	Comp Lab2 Linux Operating System	-	3	80	-	50	3

Syllabus of B.Sc.(IT) (Bachelor of Information Technology)

B.Sc.(IT) Third Year (Semester-6)

Code No.	Subject Title	Teaching Period/ Week Theory	Practical	Maximum Marks A	Internal Test Marks B	Total Marks (A+B)	Duration of Exam Hours
SEMESTER-5							
B.Sc.ITS6.05	PHP And MySQL	4	-	80	20	100	3
B.Sc.ITS6.06	Programming in C#.net	4	-	80	20	100	3
B.Sc.ITS6.07	Artificial Intelligence	4	-	80	20	100	3
B.Sc.ITS6.08	Project	0	-	80	20	100	3
B.Sc.ITS6.PR3	Comp Lab3 PHP And MySQL	-	3	80	-	50	3
B.Sc.ITS6.PR2	Comp Lab4 Programming in C#.net	-	3	80	-	50	3

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B.Sc. IT.S5.01 Java Programming

Total Lectures: 53 **(80 Marks)**

1. Introduction to Java **9Hrs**

- 1.1 Java history
- 1.2 Java features
- 1.3 How Java differ from C and C++
- 1.4 Java Environment, Java program structure
- 1.5 Java Virtual Machine
- 1.6 Constants, Variables & Data types

2. Branching and Looping Statements **9Hrs**

- 2.1 Simple if statement
- 2.2 If… Else statement
- 2.3 Nested If … Else statement
- 2.4 The Switch statement
- 2.5 The while statement
- 2.6 The do statement
- 2.7 The for statement

3. Arrays, Strings, Vectors **7Hrs**

- 3.1 Arrays
- 3.2 Creating Arrays
- 3.3 One Dimensional Arrays
- 3.4 Two Dimensional Arrays
- 3.5 Strings
- 3.6 Vectors
- 3.7 Wrapper Classes

4. Classes, Objects and Methods **9Hrs**

- 4.1 Defining a class
- 4.2 Method declaration
- 4.3 Creating Objects
- 4.4 Accessing Class Members
- 4.5 Constructors
- 4.6 Methods Overloading
- 4.7 Static Members

4.8 Final variable, Final Class
4.9 Finalizer Methods
4.10 Interface

5. Multithreaded Programming **6Hrs**

5.1 Introduction
5.2 Creating Threads
5.3 Extending the Thread Class
5.4 Stopping & Blocking a Thread
5.5 Life Cycle of thread
5.6 Thread Priorities
5.7 Synchronization

6. Exception Handling **6Hrs**

6.1 Types of Error
6.2 Exceptions
6.3 Syntax of Exception handling code
6.4 Finally statement
6.5 Throwing our won Exceptions

7. APPLET Programming **7Hrs**

7.1 Introduction
7.2 Preparing to Write Applets
7.3 Building Applet code
7.4 Applet Life Cycle
7.5 Applet Tag
7.6 Running Applet

Reference Books:

1. "Programming with JAVA a Primer" E. Balagurusamy TATA McGraw Hill
2. "The Complete Reference JAVA 2" H. Schlidt

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B.Sc. IT S5.02 Linux Operating System

Total Lectures: 51 **(80 Marks)**

1 **Fundamentals of Linux** **05Hrs**

- 1.1 Advantages of Linux
- 1.2 Other Linux distributions
- 1.3 Red Hat Linux Installation
- 1.4 Concept of Linux loader

2 Working with Linux **07Hrs**

- 2.1 Linux file system
- 2.2 Shells, Text editors
- 2.3 Basic concept of devices
  - 2.3.1 Block Devices
  - 2.3.2 Character Devices
- 2.4 various kinds of hardware
  - 2.4.1 Hard disks
  - 2.4.2 Floppy Disk Drives
  - 2.4.3 CD-ROM Drives
  - 2.4.4 USB Devices

3 Linux Commands **15Hrs**

Adduser, alias, at, atrm, banner, batch, cat, cd, chmod, chown, chroot, cp, cpio, dc, dd, dir, du, Find, finger, grep, unzip, gunzip, halt, hostname, ifconfig, kill, ln, locate, login, logout, look, Man, mcopy, mdel, mdir, mlabel, more, mv, netstat, passwd, ping, ps, pwd, rm, rmdir, route, Shutdown, sort, su, tar, tree, unzip, vi, vdir, who, whoami, wc, zip,

4 Managing Services **08Hrs**

- 4.1 Linux Boot Process
- 4.2 System services and runlevels
- 4.3 Controlling services at boot with administrative tools
- 4.4 Starting and stopping services manually

5 Printing with Linux **08Hrs**

- 5.1 Printer devices
- 5.2 Local printer installation
- 5.3 Network printer installation
- 5.4 Linux printing commands
- 5.5 Using the Common Unix Printing System (CUPS)

6 Networking Concepts **08Hrs**

- 6.1 Networking with TCP/IP
- 6.2 Hardware devices for networking
- 6.3 Introduction to DNS
- 6.4 Introduction to DHCP

Reference Books

1. Red Hat Linux Unleashed by Bill Ball, David Pitts
2. Fedora Unleashed by Bill Ball
3. Linux Command Instant Reference by Bryan Pfaffenberger

Syllabus of B.Sc.(IT) (Bachelor of Information Technology)

B.Sc. IT S5.03 TCP/IP

Total Lectures: 49 **(80 Marks)**

1. **Introduction and overview** 7Hrs
   - 1.1 The motivation of Internetworking.
   - 1.2 The TCP/IP Internet.
   - 1.3 Internet services.
   - 1.4 History and scope of the Internet.
   - 1.5 The Internet Architecture Board.
   - 1.6 The IAB Recognition

2. **Reviews of Underlying Network Technologies** 8Hrs
   - 2.1 Introduction.
   - 2.2 Two Approaches to Network communication, LAN, WAN.
   - 2.3 Ethernet Technology.
   - 2.4 Fiber Distributed Data Interconnection (FDDI).

3. **Internetworking Concepts and Architectural Model** 9Hrs
   - 3.1 Introduction.
   - 3.2 Application level Interconnection, properties of the Internet.
   - 3.3 Network level Interconnection.
   - 3.4 Internet Architecture.

4. **Internet Addresses** 8Hrs
   - 4.1 Introduction.
   - 4.2 Universal Identifiers.
   - 4.3 Three Primary classes of IP- addresses.
   - 4.4 Network and Broadcast addresses.
   - 4.5 Addresses specify Network connection.

5. **Internet Protocol: Connectionless Data gram Delivery.** 9Hrs
   - 5.1 Introduction.
   - 5.2 A Virtual Network.
   - 5.3 Internet Architecture and Philosophy.
   - 5.4 The concept of Unreliable Delivery.
   - 5.5 Connectionless Delivery system.
   - 5.6 The purpose of the Internet Protocol.
   - 5.7 Introduction to Internet Datagram.

6. Reliable Stream Transport Service (TCP) 8Hrs

6.1 Introduction, the Need for Stream delivery.
6.2 Properties of the reliable delivery service, providing reliability.
6.3 The Idea behind Sliding Window.
6.4 The Transmission Control Protocol.
6.5 Connections and Endpoints.
6.6 Introduction to ATM

Books Recommended:

1] Internetworking with TCPIIP, PriDc, T, les, Protocols & Architecture
By- Dougias E. Comer (PHI) (Vol,-5 Ed.)

2] Internetworking with TCPIIP, PriDc, T, les, Protocols & Architecture
By- Dougias E. Comer (PHI) (Vol,-3 Ed.)

3] Internetworking with TCPIIP, Principles, and Protocols & Architecture
By- Dougles E. Comer (Vol-14th Ed.) (LPE) (Pearson Education)

Syllabus of B.Sc.(IT) (Bachelor of Information Technology)

B.Sc. IT S5.04 Computer System Security

Total Lectures: 53 **(80 Marks)**

1. Introduction to Policies, Standards & Guideline 06Hrs

Different types of policy standards and guidelines
Common elements
Policy standards and guide development
Policy creation

2. Services mechanism and attacks 08Hrs

2.1 Introduction to services mechanism and attacks
2.2 OSI security architecture
- 2.2.1 Security services
- 2.2.2 Security mechanism
- 2.2.3 Security attacks
- 2.2.4 A model for network security

3. Classical encryption techniques 09Hrs

3.1 Symmetric Cipher model
- 3.1.1 Cryptography
- 3.1.2 Crypto analysis

3.2 Substitution Techniques
- 3.2.1 Caesar Cipher
- 3.2.2 Monoalphabetic Cipher
- 3.2.3 Play air Cipher
- 3.2.4 Hill Cipher
- 3.2.5 Polyalphabetic Cipher

3.3 Transposition Techniques
3.4 Steganography

4. Intruders 07Hrs

4.1 Intruders
4.2 Intrusion Techniques
4.3 Password Management

5. Malicious Software **08Hrs**

5.1 Viruses & related threats
5.2 Viruses countermeasures

6. Firewalls **06Hrs**

6.1 Firewall design Principal
6.2 Trusted System

7. Mail & WEB Security **09Hrs**

7.1 Pretty good privacy
7.2 S/MIME
7.3 Web Security Considerations
7.4 Secure Sockets Layer & Transport Layer Security
7.5 Secure Electronic Transaction

Reference Books

1. Cryptography & Network Security – William Stallings
2. Security Architecture & Design Deployment Operation –
Cistopher M.King

Syllabus of B.Sc.(IT) (Bachelor of Information Technology)

B.Sc. IT S6.05 PHP and MySQL

Total Lectures: 53 **(80 Marks)**

1. Introduction to PHP

1.1 Basic Syntax
1.2 Sending Data to the Web Browser
1.3 Understanding PHP, HTML, and White Space
1.4 Writing Comments
1.5 What Are Variables?
1.6 About Strings
1.7 About Numbers
1.8 About Constants

2. Programming with PHP

2.1 Creating an HTML Form
2.2 Handling an HTML Form
2.3 Managing Magic Quotes
2.4 Conditionals and Operators
2.5 Validating Form Data
2.6 What Are Arrays?
2.7 For and While Loops

3. Creating Dynamic Web Sites

3.1 Including Multiple Files
3.2 Handling HTML Forms with PHP Redux
3.3 Making Sticky Forms
3.4 Creating and Calling Your Own Functions
3.5 Variable Scope
3.6 Date and Time Functions
3.7 Sending Email

4. Introduction to SQL and MySQL

4.1 Choosing Your Column Types
4.2 Choosing Other Column Properties
4.3 Using the mysql Client
4.4 Creating Databases and Tables
4.5 Inserting Records
4.6 Selecting Data

9. Web Application Security

9.1 More Secure Form Validation
9.2 Handling HTML
9.3 Validating Data by Type
9.4 Form Validation with JavaScript

References

1. PHP and MySQL for Dynamic Web Sites: Visual Quickpro Guide, Second Edition by Larry Ullman
2. Programming PHP By Rasmus Lerdorf, Kevin Tatroe, Peter MacIntyre

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B.Sc. IT S6.06 Programming in C#.Net

Total Lectures: 50 **(80 Marks)**

1. Introducing C# **06Hrs**

- 1.1. What is c#
- 1.2. Why C# & Evolution of C#
- 1.3. Character tics of C#
- 1.4. How C# differs from C++ & Java
- 1.5. Introduction to .Net Technology & Framework
- 1.6. The Common language Runtime(CLR)
- 1.7. Visual Studio .Net & .Net languages

2. Features in Visual Studio.net **05Hrs**

- 2.1. Integrated Development environment
- 2.2. Start page
- 2.3. Solution explorer window
- 2.4. Class view window
- 2.5. Object browser
- 2.6. Code window
- 2.7. Intellisense
- 2.8. Heap facility
- 2.9. Code Debugging
- 2.10. Project types

3. Arrays, String & Operators **05Hrs**

- 3.1. Jagged Arrays
- 3.2. Array & ArayList class
- 3.3. string class
- 3.4. Boxing & Unboxing variable
- 3.5. Short circuiting operators

4. Properties, Indexers, Delegates & Events **06Hrs**

- 4.1. Properties
- 4.2. Indexers
- 4.3. Delegates
- 4.4. Multicast Delegates
- 4.5. Events

5. Namespace, interface & Exception handling 04Hrs

5.1. Creating & using Namespace(DLL library)
5.2. Creating & using interface
5.3. Exception

6. Multithreading 06Hrs

6.1. Understanding System. Threading Namespace
6.2. Creating & starting Thread
6.3. Threading synchronization & Pooling

7. Windows Application 10Hrs

7.1. Event Driven Programming Model
7.2. Important classes used in windows application
7.3. TextBox & Label Control
7.4. Button, CheckBox, RadioButton & GroupBox Control
7.5. ListBox & ComboBox control
7.6. Month Calendar Control
7.7. Docking Control
7.8. Tree View Control
7.9. Menu & Toolbar control
7.10. Dialog Boxes

8. Database Connectivity 08Hrs

8.1. Advantages of ADO.NET
8.2. Managed Data providers
8.3. Developing a Simple ADO.NET Based Application
8.4. Retrieving & Updating Data From Tables.
8.5. Disconnected Data Access Through Dataset Objects

References

1. Programming in C# A Primer - Second Edition By - E Balagurusamy
2. Visual C#.Net By – C Muthu
3. C# 2005 Programming Black Book By Matt Telles & Kogenet Solution Inc.
4. C#.Net Programming Wrox Publication

Syllabus of B.Sc.(IT) (Bachelor of Information Technology)

B.Sc. IT S6.07 ARTIFICIAL INTELLIGENCE

Total Lectures: 45 **(80 Marks)**

AIM

Artificial Intelligence aims at developing computer applications, which encompasses perception, reasoning and learning and to provide an in-depth understanding of major techniques used to simulate intelligence.

OBJECTIVES

• To provide a strong foundation of fundamental concepts in Artificial Intelligence

• To provide a basic exposition to the goals and methods of Artificial Intelligence

• To enable the student to apply these techniques in applications which involve perception, reasoning and learning.

CHAPTER I INTRODUCTION 8Hrs

Intelligent Agents – Agents and environments - Good behavior – The nature of environments – structure of agents - Problem Solving - problem solving agents – example problems – searching for solutions – uniformed search strategies - avoiding repeated states – searching with partial information.

CHAPTER II SEARCHING TECHNIQUES 10Hrs

Informed search and exploration – Informed search strategies – heuristic function – local search algorithms and optimistic problems – local search in continuous spaces – online search agents and unknown environments - Constraint satisfaction problems (CSP) – Backtracking search and Local search for CSP – Structure of problems - Adversarial Search – Games – Optimal decisions in games – Alpha – Beta Pruning – imperfect real-time decision – games that include an element of chance.

CHAPTER III KNOWLEDGE REPRESENTATION 10Hrs

First order logic – representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic - Inference in First order logic – prepositional versus first order logic – unification and lifting – forward chaining – backward chaining - Resolution

- Knowledge representation - Ontological Engineering - Categories and objects – Actions - Simulation and events - Mental events and mental objects

CHAPTER IV LEARNING 9Hrs

Learning from observations - forms of learning - Inductive learning - Learning decision trees - Ensemble learning - Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming - Statistical learning methods - Learning with complete data - Learning with hidden variable - EM algorithm - Instance based learning - Neural networks - Reinforcement learning – Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning.

CHAPTER V APPLICATIONS 8Hrs

Communication – Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation – Discourse understanding – Grammar induction - Probabilistic language processing - Probabilistic language models – Information retrieval – Information Extraction – Machine translation.

TEXT BOOK

1. Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", 2nd Edition, Pearson Education / Prentice Hall of India, 2004.

REFERENCES

1. Nils J. Nilsson, "Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt. Ltd., 2000.
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", 2nd Edition, Tata McGraw-Hill, 2003.
3. George F. Luger, "Artificial Intelligence-Structures And Strategies For Complex Problem Solving", Pearson Education / PHI, 2002.