

**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		Maximum Marks A	Internal Test Marks B	Total Marks (A+B)	Duration of Exam Hours
		Theory	Practical				
<b>SEMESTER-5</b>							
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		Maximum Marks A	Internal Test Marks B	Total Marks (A+B)	Duration of Exam Hours
		Theory	Practical				
<b>SEMESTER-5</b>							
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

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

## B.Sc. IT.S5.01 Java Programming

**Total Lectures: 53**

**(80 Marks)**

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|--|-------------|
| <b>1. Introduction to Java</b>               | <b>9Hrs</b> |
| 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        |             |
| <br>   |             |
| <b>2. Branching and Looping Statements</b>   | <b>9Hrs</b> |
| 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                        |             |
| <br>   |             |
| <b>3. Arrays, Strings, Vectors</b>           | <b>7Hrs</b> |
| 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                          |             |
| <br>   |             |
| <b>4. Classes, Objects and Methods</b>       | <b>9Hrs</b> |
| 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. Schildt

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

## B.Sc. IT S5.02 Linux Operating System

**Total Lectures: 51**

**(80 Marks)**

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- 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)**

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- 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 TCP/IP, Principles, and Protocols & Architecture  
By- Douglas E. Comer (PHI) (Vol,-5 Ed.)
- 2] Internetworking with TCP/IP, Principles, and Protocols & Architecture  
By- Douglas E. Comer (PHI) (Vol,-3 Ed.)
- 3] Internetworking with TCP/IP, Principles, and Protocols & Architecture  
By- Douglas E. Comer (Vol-14<sup>th</sup> 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)**

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- 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

- |   |              |
|---|--------------|
| <b>5. Malicious Software</b>                        | <b>08Hrs</b> |
| 5.1 Viruses & related threats                       |              |
| 5.2 Viruses countermeasures                         |              |
| <br>  |              |
| <b>6. Firewalls</b>                                 | <b>06Hrs</b> |
| 6.1 Firewall design Principal                       |              |
| 6.2 Trusted System                                  |              |
| <br>  |              |
| <b>7. Mail &amp; WEB Security</b>                   | <b>09Hrs</b> |
| 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)**

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### **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

- 4.7 Using Conditionals
- 4.8 Using LIKE and NOT LIKE
- 4.9 Sorting Query Results
- 4.10 Limiting Query Results
- 4.11 Updating Data
- 4.12 Deleting Data
- 4.13 Using Functions

## **5. Advanced SQL and MySQL**

- 5.1 Database Design
- 5.2 Performing Joins
- 5.3 Grouping Selected Results
- 5.4 Creating Indexes
- 5.5 Using Different Table Types
- 5.6 Performing FULLTEXT Searches
- 5.7 Database Optimization

## **6. Error Handling and Debugging**

- 6.1 General Error Types and Debugging
- 6.2 Displaying PHP Errors
- 6.3 Adjusting Error Reporting in PHP
- 6.4 Creating Custom Error Handlers
- 6.5 Logging PHP Errors
- 6.6 PHP Debugging Techniques
- 6.7 SQL and MySQL Debugging Techniques

## **7. Using PHP with MySQL**

- 7.1 Modifying the Template
- 7.2 Connecting to MySQL and Selecting the Database
- 7.3 Executing Simple Queries
- 7.4 Retrieving Query Results
- 7.5 Ensuring Secure SQL
- 7.6 Counting Returned Records
- 7.7 Updating Records with PHP

## **8. Cookies and Sessions**

- 8.1 Using Cookies
- 8.2 Using Sessions
- 8.3 Sessions and Cookies
- 8.4 Improving Session Security

## **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

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

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

**Total Lectures: 50**

**(80 Marks)**

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- 1. Introducing C#** **06Hrs**
  - 1.1. What is c#
  - 1.2. Why C# & Evolution of C#
  - 1.3. Characteristics 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)**

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### **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 – propositional 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.