

**Veer Narmad South Gujarat University,
Surat**

**Master of Science (Information &
Communication Technology)
[Two Year Post Graduate Course]**

Semester :1

**Syllabus
(Revised)**

Effective from July 2010

Effective from July 2010

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information & Communication Technology)
Semester I
Teaching and Evaluation Scheme

Paper Sr. No.	Paper Title	Teaching Schedule (Hours/Week)		University Exam Theory / Practical Duration		Internal Exam Theory / Practical Duration		Total Theory / Practical
		Lect	Prac	Hrs.	Marks	Hrs.	Marks	
ICT101	Java Web Development	4	-	3	70	2	30	100
ICT102	Enterprise Java	4	-	3	70	2	30	100
ICT103	Software Engineering	4	-	3	70	2	30	100
ICT104	TCP/IP	4	-	3	70	2	30	100
ICT105	Information Security and Applications	4	-	3	70	2	30	100
ICT106	Project	-	10	-	140	-	60	200
Total		30		490		210		700

VEER NARMAD SOUTH GUJARAT UNIVERSITY SURAT
M.Sc. (Information & Communication Technology)
Semester I

Paper No : ICT 101

L: 4 Hrs

Paper Title : Java Web Development

1. Java Web Architecture

- 1.1. The Java Advantage for Web
- 1.2. Java Editions
- 1.3. Java EE Web Architecture
- 1.4. Java Web Application Servers
- 1.5. Installing and Configuring Glassfish Application Server
- 1.6. Java EE APIs for Building web Applications
- 1.7. IDEs for Enterprise Application Development

2. Java Database Programming

- 2.1. The 2-Tier Client Server Architecture
- 2.2. Java Database Connectivity (JDBC) – API for Accessing Databases
- 2.3. Database Drivers Loading a Driver Class
- 2.4. Connecting the Database Server
- 2.5. Query with Statement Object
- 2.6. The ResultSet Object
- 2.7. Faster Execution with PreparedStatement Object
- 2.8. The ResultSetMetaData Object
- 2.9. Java-SQL Data Types
- 2.10. JDBC DML Operations
- 2.11. Batching the Operations
- 2.12. The CallableStatement Object
- 2.13. Handling Database Transactions

3. Java Servlets

- 3.1. Introduction to Java Servlets
- 3.2. The Java Servlet API
- 3.3. The Servlet Life Cycle
- 3.4. CGI and Servlets
- 3.5. Request and Response
- 3.6. Forms and QueryStrings
- 3.7. HTTP Headers
- 3.8. Cookies
- 3.9. Session Tracking and Management
- 3.10. ServletContext and ServletConfig
- 3.11. Initialisation Parameters
- 3.12. Inter-Servlet Communication with Request Dispatching and Forwarding
- 3.13. Filters
- 3.14. Web Listeners
- 3.15. Packaging and Deployment

4. Java Server Pages

- 4.1. Overview of Java Server Pages (JSP)
- 4.2. JSP Life Cycle
- 4.3. JSP Page Directives
- 4.4. Declaration Element
- 4.5. Scripting Elements
- 4.6. The Action tags
- 4.7. The Implicit Objects
- 4.8. Form Submission
- 4.9. The Assignment Tag
- 4.10. The Form Validation with Java Bean
- 4.11. Plugins

5. JSTL and EL

- 5.1. Introduction to Java Standard Tag Library
- 5.2. JSTL in JSP
- 5.3. Response with JSTL
- 5.4. EL – The Expression language
- 5.5. Variable Assignment with *set* Tag
- 5.6. Request and Response with JSTL/EL
- 5.7. The Logic and The Iteration with JSTL
- 5.8. Property Files
- 5.9. Internationalisation and Localisation with *fmt* Tag
- 5.10. Session and Application Attributes
- 5.11. JSTL and Databases
- 5.12. Working with XML
- 5.13. A JSTL/EL Application

6. The Java Web Application Frameworks

- 6.1. STRUTS
- 6.2. SPRING
- 6.3. JAVA SERVER FACES

Main Readings :

1. Head First Servlets and JSP - Bryan Basham Kathy Sierra Bert Bates - O'Reilly Media
2. Core Servlets and Javasever Pages - Marty Hall Larry Brown - Sun Micro System

Supplementary Readings:

1. Java Servlet & JSP Cookbook - Bruce W. Perry - O'reilly Publication
2. Beginning JSP™ JSF™ and Tomcat™ Web Development: From Novice to Professional - Giulio Zambon and Michael Sekler –Apress

Effective from July 2010

VEER NARMAD SOUTH GUJARAT UNIVERSITY SURAT
M.Sc. (Information & Communication Technology)
Semester I

Paper No : ICT 102**L: 4 Hrs****Paper Title : Enterprise Java**

- 1. Introduction to Java Enterprise Edition**
 - 1.1. Tiered model architectures – principles and goals
 - 1.2. Java EE definition and characteristics
 - 1.3. Java EE technologies in a multi-tier architecture

- 2. Java Naming and Directory Interfaces**
 - 2.1. JNDI Basics
 - 2.2. Definition and structure of JNDI
 - 2.3. Naming and Directory Services
 - 2.4. Context initial context and JNDI tree

- 3. Enterprise Java Beans**
 - 3.1. Stateless Session Bean
 - 3.2. Statefull Session Bean
 - 3.3. Binding and looking up objects
 - 3.4. Singleton Beans
 - 3.5. Local and Remote Lookups
 - 3.6. Timers and Schedulers
 - 3.7. Asynchronous EJB Methods

- 4. Java Messaging Services**
 - 4.1. JMS Architecture
 - 4.2. Queue and Topic Messages
 - 4.3. Message Driven Beans
 - 4.4. JMS Producer and Consumers
 - 4.5. Creating Web Client for MDB

- 5. Java Persistence**
 - 5.1. JPA overview and JPA architecture
 - 5.2. ORM
 - 5.3. Entity
 - 5.4. Annotations
 - 5.5. One to One ,One to Many ,Many to Many Relationships
 - 5.6. JPA Query Language
 - 5.7. Named Queries, Dynamic Queries AND Native Queries
 - 5.8. Transactions
 - 5.9. Persistence with Hibernate

- 6. Web Services**
 - 6.1. Introduction SOAP Basics
 - 6.2. UDDI
 - 6.3. WSDL and Schema
 - 6.4. Web Service Publishing
 - 6.5. Web Service Discovery

- 6.6. Web services for EJBs and Consuming them
- 6.7. Securing Web Service Communication
- 6.8. Introduction to REST services

7. Web Application Security

- 7.1. The Need of Security
- 7.2. Security Threats
- 7.3. Realm Users Group and Roles
- 7.4. Basic Authentication
- 7.5. Form Based Authentication
- 7.6. Protecting Your Resources
- 7.7. Java API for Authentication and Security – JAAS
- 7.8. Maintaining Confidentiality with JAAS
- 7.9. Generating Certificates
- 7.10. Signing Your Certificate
- 7.11. SSL and Certificate Based Authentications
- 7.12. Providing Security to Enterprise Applications

Main Readings:

1. Mastering Enterprise JavaBeans and the Java 2 Platform Enterprise Edition: - Ed Roman-WILLEY.
2. Java 6 EE Tutorial Basic Concepts - Sun Micro System
3. Beginning Java™ EE 6 Platform with GlassFish™ 3: From Novice to Professional - Antonio Goncalves -Apress

Supplementary Readings:

1. Beginning EJB 3 Application Development From Novice to Professional- Raghu R. Kodali and Jonathan Wetherbee with Peter Zadrozny - Apress
2. Pro JPA 2: Mastering the Java™ Persistence API (Expert's Voice in Java Technology) - Mike Keith and Merrick Schincariol - Apress

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information & Communication Technology)
Semester I

Paper No : ICT103

L: 4 Hrs

Paper Title : Software Engineering

1. Software Matrix & Project Planning

- 1.1. Software Measurements
- 1.2. Metrics for Software Quality
- 1.3. Project Planning Objectives
- 1.4. Software Scope
- 1.5. Resources
- 1.6. Decomposition Techniques
- 1.7. Empirical Estimation Model
- 1.8. Make-Buy Decision

2. Risk Management

- 2.1. Software Risk
- 2.2. Risk Identification
- 2.3. Projection
- 2.4. Migration
- 2.5. Monitoring
- 2.6. Management

3. Project Scheduling & Tracking

- 3.1. Relationship between People & Effort
- 3.2. Defining a Task set for the Software Project
- 3.3. Selecting & Refining Software Engineering Tasks
- 3.4. Scheduling

4. Software Configuration Management

- 4.1. Baselines
- 4.2. SCM Process
- 4.3. Change Control
- 4.4. Version Control
- 4.5. Configuration Audit
- 4.6. Status Reporting
- 4.7. SCM Standards

5. Object Oriented Concepts & Principles

- 5.1. Object Oriented Paradigm & Concepts
- 5.2. Identifying the elements of an Object Model
- 5.3. Management of Object Oriented Software Projects

6. Object Oriented Analysis & Design

- 6.1. Domain Analysis
- 6.2. Generic Components of the OO Analysis & OOA Process
- 6.3. Object Relationship Model
- 6.4. Object Behavior Model
- 6.5. Generic Components of the OO Design & System Design Process
- 6.6. Object Design Process & Design Pattern.

7. Web Engineering

- 7.1. Attributes of web based application
- 7.2. Framework of Web engineering
- 7.3. Analyzing Web-Based system
- 7.4. Design of Web-Based Application
- 7.5. Testing of Web Application
- 7.6. Management Issues

8. Project Management Tools

Case studies may be carried out at appropriate stages of the course.

Main Readings :

1. Software Engineering A practitioner's approach - Roger S Pressman - McGraw Hill
2. Object Oriented Modeling Design – James Rumbaugh, Michael Blaha – PHI
3. An Integrated Approach to Software Engineering - Pankaj Jalote - Narosa Pub.

Supplementary Readings :

1. Software Engineering Concepts - Fairley R E - Mc-Graw Hill
2. Software Engineering - Lewis T G - Mc-Graw Hill
3. Fundamentals of Software Engineering – Carlo Ghezzi
4. IEEE standard for software user documentation, STD 1063-1987
5. Software Engineering- A programming approach - D. Bell, I. Morrey - PHI

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information & Communication Technology)
Semester I

Paper No : ICT104

L: 4 Hrs

Paper Title : TCP/IP

1. Introduction to Internet Protocols and Standards

2. Overview of OSI model

3. TCP/IP Model

4. Overview of Physical and Data link layer

5. IP Layer

- 5.1. IP : Classful addressing
- 5.2. IP : Classless addressing
- 5.3. Delivery, Forwarding and Routing
- 5.4. ARP and RARP
- 5.5. Internet Protocol (IP)
 - 5.5.1. Datagram
 - 5.5.2. Fragmentation
 - 5.5.3. Options
 - 5.5.4. Checksum
- 5.6. ICMP
- 5.7. IGMP

6. UDP

- 6.1. Process to Process Communication
- 6.2. Port Numbers and Socket Address
- 6.3. User Datagram
- 6.4. Checksum
- 6.5. UDP Operations
- 6.6. Use of UDP

7. TCP

- 7.1 TCP Services
- 7.2 TCP Features
- 7.3 TCP Segment
 - 7.3.1. Format
 - 7.3.2. Encapsulation
- 7.4 TCP Connection
- 7.5 State Transition Diagram
- 7.6 Flow Control
- 7.7 Error Control
- 7.8 Congestion Control
- 7.9 TCP Timers
- 7.10 TCP Options

8. Application Layer

- 8.1. DNS
- 8.2. SNMP
- 8.3. Electronic Mail
- 8.4. WWW

- 8.5. SMTP
- 8.6. FTP
- 8.7. TFTP
- 8.8. TELNET
- 8.9. HTTP

9. Host Configuration

- 9.1 BOOTP
- 9.2 DHCP

10. Introduction to Unicast and Multicast Routing Protocols

11. Introduction to Ipv6

Main Readings:

- 1. TCP/IP Protocol Suit - Behrouz A. Forouzan - TMH
- 2. TCP/IP Illustrated Volume I - W. Richard Stevens - Pearson Education
- 3. TCP/IP illustrated - N P Gopalan, B Siva Sadan - PHI

Supplementary Readings:

- 1. Computer Networks -Tanenbaum A. S.- PHI
- 2. Computer Networks-Protocols, Standards and Interfaces - Black U - PHI
- 3. Data and Computer Communications - Stallings W. - PHI
- 4. Introduction to Cisco Router Configuration - Laurra Chappell (Ed) - Techmedia

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information & Communication Technology)
Semester I

Paper No : ICT 105

L: 4 Hrs

Paper Title : Information Security and Applications

1. Introduction to Security

- 1.1. Need for security
- 1.2. Security approaches
- 1.3. Principles of security
- 1.4. Types of attacks
- 1.5. Cryptography and the role of cryptography in data security

2. Symmetric ciphers

- 2.1. Symmetric Cipher model
- 2.2. Substitution & Transposition techniques
- 2.3. Rotor machines and Steganography

3. Block and Stream ciphers

- 3.1. Block ciphers versus stream ciphers
- 3.2. Simplified data encryption standard (DES)
- 3.3. Differential and linear Cryptanalysis
- 3.4. Block cipher modes of operation
- 3.5. Advanced encryption standard (AES)
- 3.6. RC4 stream cipher

4. Public key cryptography

- 4.1. Principles of public key cryptosystems
- 4.2. RSA algorithm

5. Key management

- 5.1. Key distribution scenarios
- 5.2. Key management
- 5.3. Diffie-Hellman key exchange

6. Message authentication and hash functions

- 6.1. Authentication requirements
- 6.2. Authentication functions
- 6.3. Message authentication codes
- 6.4. Hash functions
- 6.5. MD5 message digest algorithm
- 6.6. Secure Hash algorithm (SHA)

7. Digital signatures and authentication protocols

- 7.1. Digital signatures
- 7.2. Authentication protocols
- 7.3. Digital signature standard

8. Network security

- 8.1.Kerberos
- 8.2.Pretty good privacy
- 8.3.S/MIME

9. Internet protocol Security

- 9.1.IP security overview
- 9.2.IP security architecture
- 9.3.Authentication header
- 9.4.Encapsulation security payload
- 9.5.Security associations and combining SA
- 9.6.Key management

10. Web security

- 10.1 Secure socket layer and transport layer security

11. Firewalls

12. Biometric techniques

Main Readings:

1. Cryptography and Network Security – B. Forouzan, McGraw-Hill.
2. William Stallings : Cryptography and Network Security - Principles and Practice, Prentice Hall.

Supplementary Readings:

1. Information security: theory and practice – Dhiren R. Patel - PHI

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information & Communication Technology)
Semester I

Paper No : ICT 106

P:10 Hrs

Paper Title : Project

The students are required to carry out project work for part time during the semester, based upon the Theory subjects.

**Veer Narmad South Gujarat University,
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**Master of Science (Information &
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[Two Year Post Graduate Course]**

Semester :2

**Syllabus
(Revised)**

Effective from July 2010

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VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information & Communication Technology)
Semester II
Teaching and Evaluation Scheme

Paper Sr. No.	Paper Title	Teaching Schedule (Hours/Week)		University Exam Theory / Practical Duration		Internal Exam Theory / Practical Duration		Total Theory / Practical
		Lect	Prac	Hrs.	Marks	Hrs.	Marks	
ICT201	C# .NET	4	-	3	70	2	30	100
ICT202	Advanced .NET	4	-	3	70	2	30	100
ICT203	Artificial Intelligence	4	-	3	70	2	30	100
ICT204	Software Testing and Quality Assurance	4	-	3	70	2	30	100
ICT205	Software Testing and Quality Assurance (Lab)	-	2		35		15	50
ICT206	IT Business Communication (Lab)	-	4		35		15	50
ICT207	Project	-	10	-	140	-	60	200
Total		32			490		210	700

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information & Communication Technology)
Semester II

Paper No : ICT201
Paper Title : C# .NET

L: 4 Hrs

1 .NET Architecture.

2. C# Language

- 2.1. Introduction to C#
- 2.2. Data Types
- 2.3. C# Predefined Types
- 2.4. Complex Types
- 2.5. Variables
- 2.6. Constants
- 2.7. Operators
- 2.8. Flow Control
- 2.9. Program Structure

3. Object Oriented C#

- 3.1. Method Overloading
- 3.2. Construction & Disposal
- 3.3. Operator Overloading
- 3.4. Indexers
- 3.5. Interfaces
- 3.6. Collections

4. Exception & Error Handling

5. Generics

- 5.1. Generic Types
- 5.2. Generic Methods
- 5.3. Constraints
- 5.4. Casting
- 5.5. Inheritance
- 5.6. Static Members

6. Delegates

- 6.1. Define a Delegate
- 6.2. Create a Delegate
- 6.3. Invoking a Delegate
- 6.4. Array of Delegates
- 6.5. Asynchronous Invocation
- 6.6. Multicast Delegates

7. Events

- 7.1. Publishing an Event
- 7.2. Subscribe
- 7.3. Raising an Event

8. C# Pre-processor Directives

9. Assemblies, Threads, and AppDomains

10. Reflection

- 10.1. Obtaining a Type Object
- 10.2. Loading Assemblies
- 10.3. Browsing Type Information
- 10.4. Dynamic Invocation
- 10.5. Type Creation
- 10.6. Late Binding Delegates

11 Serialization

- 11.1. Configuring Objects for Serialization
- 11.2. Choosing a Serialization Formatter
- 11.3. Serializing Objects Using the BinaryFormatter
- 11.4. Serializing Objects Using the SoapFormatter
- 11.5. Serializing Objects Using the XmlSerializer
- 11.6. Serializing Collections of Objects
- 11.7. Customizing the Serialization Process

12 Attributes

- 12.1. Intrinsic Attributes
- 12.2. Custom Attributes

13 LINQ

- 13.1. Language features introduced by LINQ
- 13.2. Anonymous Types
- 13.3. Object Initializers
- 13.4. Implicitly Typed Local Variables
- 13.5. Extension method
- 13.6. Lambda Expressions
- 13.7. Query Expressions
- 13.8. LINQ to Objects
- 13.9. LINQ to XML
- 13.10. LINQ Data Access
- 13.11. LINQ to SQL
- 13.12. LINQ to Entities
- 13.13. Incorporating validation & business logic

Main Readings :

1. C# and the .NET Platform – Andrew Troelsen – APress
2. Professional C# -Simon Robinson- Wrox
3. Professional C# 2008 - Christian Nagel - Wrox
4. Pro LINQ: Language Integrated Query in C# 2008 - Jr. Joseph C. Rattz - Apress

Supplementary Readings :

1. C# The Basics – Vijay Mukhi - BPB
2. C# Essentials – Ben Albabari – O'Reilly
3. C# The Nuts & Bolts – Akash Sarat & Sonal Mukhi - BPB
4. C# Made Simple – BPB Publication
5. C# 3.0 Unleashed: With the .NET Framework 3.5 - Joseph Mayo- Sams

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information & Communication Technology)
Semester II

Paper No : ICT 202

L: 4 Hrs

Paper Title : Advanced .NET

1. Web Architecture

- 1.1. Introduction to web Architecture
- 1.2. Client-Side Processing
- 1.3. ASP.NET Tie-up with Web Architecture

2. Overview of ASP.NET Framework

- 2.1. ASP.NET and the .NET Framework
- 2.2. Common Language Runtime
- 2.3. .Net Framework Class Library
- 2.4. Namespaces
- 2.5. Structure of ASP.NET
- 2.6. Page Directives
- 2.7. Code Declaration Blocks
- 2.8. Code Render Block

3. Membership and Role Management in ASP .NET

- 3.1. Authorization
- 3.2. Web Site Administrative Tools
- 3.3. Public Methods of the Membership API
- 3.4. Public Methods of the Roles API

4. Localization

- 4.1. Globalization and Localization
- 4.2. Globalizing an ASP.NET Website
- 4.3. Culture and Locale
- 4.4. Switching Locale
- 4.5. Resource Files
- 4.6. Global Versus Local Resources
- 4.7. Creating Global Resources and Local Resources
- 4.8. Satellite Assemblies
- 4.9. Implicit Versus Explicit Localization
- 4.10. Incorporating Globalization
- 4.11. Setting the Culture of the Thread Based on User Selection

5. Web Services

- 5.1. Overview of Web Services
- 5.2. WebMethod Attribute
- 5.3. WebServices Attribute
- 5.4. XML Web Service
- 5.5. Invoking an XML Web Service with HTTP-Get
- 5.6. Invoking an XML Web Service with HTTP-Post
- 5.7. Invoking an XML Web Services with SOAP
- 5.8. Using the WebService Behavior
- 5.9. Using WebService Behavior Callback Functions

6. **AJAX(Asynchronous JavaScript and XML)**
 - 6.1. Server Side Ajax
 - 6.2. Client Side Ajax
 - 6.3. Ajax Toolkit
 - 6.4. Setting up and implementing Ajax

7. **Model View Controller**
 - 7.1. Page Controller Pattern in ASP.NET
 - 7.2. Problems with Page Controller Design
 - 7.3. MVC Design: Front Controller Design
 - 7.4. MVC and REST: Representation State Transfer
 - 7.5. ASP.NET MVC Framework
 - 7.6. URL Routing Engine
 - 7.7. Wiring Controller, Model, and View
 - 7.8. Unit Testing and ASP.NET MVC

8. **Windows Communication Foundation**
 - 8.1. The Role of WCF
 - 8.2. WCF Assemblies
 - 8.3. Composition of a WCF Application
 - 8.4. WCF Client Application
 - 8.5. Hosting the WCF Service
 - 8.6. Invoking a Service Asynchronously
 - 8.7. Designing WCF Data Contracts

9. **Windows Workflow Foundation**
 - 9.1. Defining Business Process
 - 9.2. Building Blocks of Workflow Foundation
 - 9.3. Workflow Foundation Assemblies and Namespaces
 - 9.4. Invoking Web Services within Workflows
 - 9.5. Reusable Workflow Foundation Code Library

10. **Windows Presentation Foundation and XAML**
 - 10.1. Introduction to WPF and XAML
 - 10.2. Types of WPF Applications
 - 10.3. WPF Assemblies
 - 10.4. XAML-Free WPF Application
 - 10.5. XAML-Centric WPF Application
 - 10.6. Transforming Markup into a .NET Assembly
 - 10.7. Programming with WPF Controls

Main Readings:

1. ASP.NET 3.5 Unleashed - Stephen Walther - Sams
2. Beginning ASP.NET 3.5: In C# and VB (Programmer to Programmer) - Imar Spaanjaars - Wrox
3. Professional ASP.NET 3.5: In C# and VB - Bill Evjen Bill Evjen - Sams
4. ASP.NET MVC Framework Unleashed - Stephen Walther - Wrox
5. Essential Windows Communication Foundation (WCF): For .NET Framework 3.5 - Steve Resnick - Pearson
6. Windows Presentation Foundation Unleashed (WPF) - Adam Nathan - Sams

Supplementary Reading:

1. Programming Microsoft ASP.NET 3.5 - Dino Esposito - Microsoft Press
2. C# 3.0 in a Nutshell: A Desktop Quick Reference, - Joseph Albahari - O'Reilly
3. Microsoft Visual Studio 2008 Unleashed - Lars Powers - Sams
4. Pro ASP.NET 3.5 in C# 2008: Third Edition (Paperback) - Matthew MacDonald - Apress
5. Beginning ASP.NET 3.5 in C# 2008: From Novice to Professional - Matthew MacDonald - Apress

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information & Communication Technology)
Semester II

Paper No : ICT 203

L: 4 Hrs

Paper Title : Artificial Intelligence

1. Introduction to AI

- 1.1. What is AI?
- 1.2. History of AI
- 1.3. The State of the Art
- 1.4. AI Problem
- 1.5. Problem Characteristics

2. Intelligent Agents

- 2.1. Introduction To Intelligent Agents
- 2.2. How Agents Should Act
- 2.3. Structure Of Intelligent Agents
- 2.4. Agents And Environments
- 2.5. Good Behavior
- 2.6. The Nature Of Environments

3. Problem Solving through AI

- 3.1. Problem Solving
- 3.2. Problem solving agents
- 3.3. Example Problems
- 3.4. Searching For Solutions
- 3.5. Search Strategies
- 3.6. Uniformed Search Strategies
- 3.7. Avoiding Repeated States
- 3.8. Searching With Partial Information.

4. Informed Search Strategies

5. Knowledge Representation

- 5.1. First order logic
- 5.2. syntax and semantics
- 5.3. Using first order logic
- 5.4. Knowledge engineering
- 5.5. Inference
- 5.6. prepositional versus first order logic
- 5.7. unification and lifting
- 5.8. forward chaining
- 5.9. backward chaining
- 5.10. Knowledge representation

6. Learning

- 6.1. Concept of Learning
- 6.2. Inductive learning
- 6.3. Learning decision trees
- 6.4. Learning Automation
- 6.5. Genetic Algorithms
- 6.6. Neural nets

7. Applications

- 7.1. Expert systems
- 7.2. Natural Language Processing
- 7.3. Statistical Reasoning
- 7.4. Fuzzy Logic
- 7.5. Reasoning Under Uncertainty
- 7.6. Gaming
- 7.7. Robotics

8. Rule Based Programming Prolog

- 8.1. Facts
- 8.2. Objects
- 8.3. Predicates and Rules
- 8.4. Prolog variable and its type
- 8.5. Arithmetic & relational operators
- 8.6. I/O predicates
- 8.7. String operations
- 8.8. fail & ! predicates
- 8.9. Recursion & repeat predicates
- 8.10. List and various operation on lists
- 8.11. File operations predicates
- 8.12. Dynamic & Static database
- 8.13. Type conversions
- 8.14. Screens & Window predicates
- 8.15. Graphics predicates

Main Readings:

- 1. Artificial Intelligence “A Modern Approach” - Stuart Russell and Peter Norvig - Pearson Education.
- 2. Artificial Intelligence - Elaine Rich and Kevin Knight- Tata McGraw Hill.
- 3. Introduction to Turbo Prolog - Carl Townsend - B. P. B. Publication

Supplementary Readings:

- 1. Expert Systems Programming in TURBO PROLOG - Marcellus- Prentice-Hall Inc.
- 2. Artificial Intelligence - Hunt, E. B. - Academic Press
- 3. Programming in Prolog - Clockskin, W. F. and Mellish, C. S. - Narosa Publ. House.
- 4. Foundation of Logic Programming - Lloyd, J.- Springer-Verlag

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information & Communication Technology)
Semester II

Paper No : ICT 204

L:4 Hrs

Paper Title : Software Testing and Quality Assurance

1. Software Testing

- 1.1. Role of Testing
- 1.2. Verification and Validation
- 1.3. Failure, Error, Fault, and Defect
- 1.4. Objectives of Testing
- 1.5. Concept of Complete Testing
- 1.6. Central Issue in Testing
- 1.7. Testing Activities
- 1.8. White-Box and Black-Box Testing

2. Testing Techniques

- 2.1. Unit Testing
- 2.2. Control Flow Testing
- 2.3. Data Flow Testing
- 2.4. Domain Testing
- 2.5. System Integration Testing
- 2.6. Functional Testing
- 2.7. Acceptance Testing

3. Test Design

- 3.1. Test Design Factors
- 3.2. Characteristics of Testable Requirements
- 3.3. Test Objective Identification
- 3.4. Modeling a Test Design Process
- 3.5. Modeling Test Results
- 3.6. Test Design Preparedness Metrics
- 3.7. Test Case Design Effectiveness

4. Test Planning

- 4.1. Structure of a Test Plan
- 4.2. Test Approach
- 4.3. Test Execution Strategy
- 4.4. Test Effort Estimation
- 4.5. Scheduling and Test Milestones
- 4.6. Evaluation and Selection of Test Automation Tools

5. Testing of Web Application

- 5.1. Testing Concepts for WebApps
- 5.2. The Testing process
- 5.3. Content Testing
- 5.4. User Interface Testing
- 5.5. Component Level Testing
- 5.6. Navigation Testing
- 5.7. Configuration Testing

- 5.8. Security Testing
- 5.9. Performance Testing

6. Object Oriented Testing

- 6.1. Testing view
- 6.2. Testing models
- 6.3. Testing Strategies
- 6.4. Test case design
- 6.5. Class level testing methods
- 6.6. Interclass test case design

7. Testing Tools

- 7.1. Test Tools and Automation
- 7.2. Working with Tools

8. Software Quality Assurance

- 8.1. Software Quality & Assurance
- 8.2. Software Review
- 8.3. Formal Technical Review
- 8.4. Software Quality Metrics
- 8.5. Formal Approaches to SQA
- 8.6. Software Reliability
- 8.7. ISO 9000 Quality Standards
- 8.8. ISO Approach to Quality Assurance systems
- 8.9. ISO 9000:2000 Software Quality Standard
- 8.10. The ISO 9001 Standards

Main Readings :

1. Software Testing and Quality Assurance - Kshirasagar Naik and Priyadarshi Tripathy - WILEY.
2. Software Engineering A practitioner's approach - Roger S Pressman - McGraw Hill
3. Effective Methods for Software Testing - William E. Perry- WILEY.

Supplementary Readings :

1. Software Engineering Concepts - Fairley R E - Mc-Graw Hill
2. Software Engineering - Lewis T G - Mc-Graw Hill
3. Fundamentals of Software Engineering – Carlo Ghezzi
4. IEEE standard for software user documentation, std 1063-1987
5. Software Engineering- A programming approach - D. Bell, I. Morrey - PHI
6. Pragmatic Software Testing – Rex Black – WILEY.
7. Software Testing Concepts and Practices – K. Mustana and R.A. Khan – Narosa Pub.

Effective from July 2010

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information & Communication Technology)
Semester II

Paper No : ICT 205

P: 2 Hrs

Paper Title : Software Testing and Quality Assurance (Lab)

The students will be required to carry out practical on software testing using testing methods and tools. A journal must be prepared for the practical work done.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information & Communication Technology)
Semester II

Paper No : ICT 206

P: 4 Hrs

Paper Title : IT Business Communication (Lab)

Practical Sessions will cover the following:

1. Presentation skills

Students shall be required to practice and prepare presentations based on IT related topics, scenarios

2. Group Discussions related to I.T Business

Students will participate in group discussions related to IT topics during practical sessions

3. Interviews

Mock interviews will be conducted during practical session

4. Communication and soft skills

Students shall be required to practice the skills during practical session using various software and tools

5. Technical writing

Students will be required to carry out practical exercises of technical writing in order to create various documents like

- 5.1. Software help file.
- 5.2. Content Development.
- 5.3. Technical presentation of project proposals.
- 5.4. Electronic Newsletter Writing
- 5.5. Business E-mails.
- 5.6. Business vocabularies.
- 5.7. Software requirement proposals
- 5.8. Scope of work development.

Students will be required to prepare and submit a journal/report containing the assignment and exercises completed during practical sessions.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (Information & Communication Technology)
Semester II

Paper No : ICT207

P: 10 Hrs

Paper Title : Project

The students are required to carry out project work for part time during the semester, based upon the Theory subjects.