Teaching and Evaluation Scheme for
VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
M.Sc. Computer Application (M.Sc.(CA))
2nd Year - Semester III
To be effective from the academic year 2013-2014

Paper No.	Paper Title Teaching	Schedule (In Hours)		Credit	University Exam		Internal Exam.	Total Marks
		Lect.	Pract.		Marks	Duration	Marks	
301	Advance PHP Programming	4	0	4	70	3	30	100
302	Mobile Application Development	4	0	4	70	3	30	100
303	Software Testing	4	0	4	70	3	30	100
304	Elective1	4	0	4	70	3	30	100
305	Elective2	4	0	4	70	3	30	100
306	Practical on Advanced PHP Programming	0	4	4	70	2	30	100
307	Practical on Mobile Application Development	0	3	3	70	2	30	100
308	Practical on Software Testing	0	3	3	70	2	30	100
Total		**20**	**10**	**30**	**560**		**240**	**800**

Elective 1 and 2 are to be selected from the following papers:

a) Cloud Computing
b) Distributed Databases
c) Multimedia Systems
d) Expert Systems

Teaching and Evaluation Scheme for
VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
M.Sc. Computer Application (M.Sc.(CA))
2nd Year - Semester IV
To be effective from the academic year 2013-2014

4th Semester					
Paper No.	**Paper Title**	**Credits**	**University Exam**	**Internal Exam.**	**Total Marks**
			Marks	Marks	
401	Project	24	280	120	400
402	Seminar	06	70	30	100
Total		**30**	**350**	**150**	**500**

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

M.Sc. Computer Application (M.Sc.(CA))

2nd Year - Semester III

syllabus for

Paper No. : 301

Paper Title: Advance PHP Programming **[Lect:4 Hrs. / Week]**

Aim: The Air of this course is to provide an in-depth knowledge of most recent Open Source based server side programming technology.

Prerequisites: Basic understanding of Web, HTTP, HTML, Database systems, Networks and Open Source Concepts.

Expected Outcome: After completion of this course, the student will be capable to develop professional web applications using PHP. implementing the concepts, methods and tools

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1 PHP Programming

- 1.1 Code structure and documentation
- 1.2 Array, Reference and Functions
- 1.3 Site structure and basics of web site development using PHP
- 1.4 PHP and OOP templates
- 1.5 Error Handling

2 Accessing Database

- 2.1 Accessing MySQL Database
  - 2.1.1 Connecting to MySQL DB Engine and database
  - 2.1.2 Executing queries and retrieving resultsets
- 2.2 Database access with PEAR:DB
  - 2.2.1 Connecting to various types of databases with DB
  - 2.2.2 Sending Queries and retrieving results
  - 2.2.3 Using Quotes, Placeholders, Sequences
- 2.3 Database access with PEAR:ADODB
  - 2.3.1 Connecting to various types of databases with ADODB
  - 2.3.2 Record Sets Management
  - 2.3.3 Generating HTML from record set
  - 2.3.4 ADODB_Pager class, PivotTableSQL and ADODB caching
  - 2.3.5 Exporting data to CSV and Tab Delimited files

3 Networking with PHP

- 3.1 Browser detection
- 3.2 Accessing other web sites with php
- 3.3 Using fsockopen()
- 3.4 Sending Plain Text Mail Message with PEAR Mail
- 3.5 Sending MIME Mail Message with Mail_mime

4 PHP Authentication, Cookies and session Management

- 4.1 Using the AUTH module and different storage containers for AUTH
- 4.2 Accessing Session Data
- 4.3 Using Auth_HTTP
- 4.4 Creating and Managing cookies
- 4.5 Session management in PHP

5 Image generation (5)

- 5.1 Creating and Manipulating images
- 5.2 Using Text in Images
- 5.3 Creating database driven graph
- 5.4 Saving and building on existing image.

6 Understanding PHP Internals (6)

- 7.1 Logging with configuration options
- 7.2 Outputting Debugging Information using various functions
  (echo, var_dump, highlight_string, get_class, get_object_vars, get_class_methods, get_class_vars, debug_backtrace, debug_print_backtrace, exit)
- 7.3 Profiling and debugging with XDebug
  - 7.3.1 Tracing,
  - 7.3.2 Profilling,
  - 7.3.3 Using remote debugging
- 7.4 Working with Code Caches
  - 7.4.1 Alternative PHP Cache(APC)
  - 7.4.2 ionCube PHP accelerator(PHPA)
  - 7.4.3 Truck MMCache

8 Extending php (6)

- 8.1 CackPhp
- 8.2 Zend
- 8.3 Smarty

References:

1	Essential PHP Tools-modules, extensions and Accelarators	David Sklar	APRESS (SPD) ISBN: 81-8128-170-5
2	PHP advanced for the World Wide Web	Larry Edward Ullman	Peachpit Press ISBN: 0-20177597-2
3	Advanced PHP for Web professionals	Christopher Cosentino	Pearson education ISBN: 0-13-008539-1
4	Expert PHP 5 Tools	Dirk Merkel	PACKT (SPD) ISBN 13 :978-93-5023-152-4
5	PHP – a Beginners Guide	Ashok Appu'	Wiley Dreamtech India Pvt. Ltd. ISBN : 81-265-0311-4
6	Learning PHP 5	David Sklar	O'Reilly (SPD) ISBN : 81-7366-732-2
7	Beginning PHP 5.1 FOR BEGGINERS	Ivan Byross, Sharanam Shah	The Team (SPD) ISBN 10: 81-8404-075-X
8	Beginning PHP 5	Dave W. Mercer, Allent Kent, Steven D. Nowicki, David Mercer, Dan Squire, Wankyu Choi	WROX (Wiley dreamTech), ISBN : 81-265-0539-

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

M.Sc. Computer Application (M.Sc.(CA))

2nd Year - Semester III

syllabus For

Paper No : 302

Paper Title: Mobile Application Development [**Lect: 4 Hrs]**

Aim: The aim of this course is to provide an in-depth knowledge of most recent Mobile Devices Application Development technology.

Prerequisites: Basic understanding of Programming, Object Oriented Concepts and Networks

Expected Outcome: After completion of this course, the student will be capable of implementing the concepts, methods and tools of mobile applications using Android.

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1. Introduction to Mobile Devices

1.1 Pervasive computing,
1.2 Definition, Evolution of Mobile Devices,
1.3 Categories and Features of Mobile Devices,

2. Smart Identification of mobile devices

2.1 Smart cards-its hardware and software
2.2 Communication between On-card and Off-card Parts
2.3 Smart Labels and Tokens
2.4 Smart Sensors and Actuators

3. Introduction to Android

3.1 Open standards for mobile devices (OHA)
3.2 Introduction to various mobile device OS
3.3 Architecture of Android OS
3.4 Introduction to Android SDK
3.5 Embedded Browsers
3.6 Types of Android Applications-Foreground Applications, Background Services and Intent Receivers, Intermittent Applications, Widgets and Containers

4. Mobile Application Development Using Android

4.1 Android Development tools (3)
    4.1.1 The Android Virtual Device and SDK Manager
    4.1.2 The Android Emulator
    4.1.3 Delvik Debug Monitor Service (DDMS)
    4.1.4 The Android Debug Bridge (ADB)
4.2 Creating Applications and Activities (5)
    4.2.1 Application Manifest and Application Life cycle, Application Priority and Process States

4.2.2 Creating and Using Resources
4.2.3 Working with Android Application Class
4.2.4 Working with android activities-Activity Life cycle, Activity stakes, Activity States, Activity Lifetimes, Android Activity Classes

4.3 Creating User Interface (4)
4.3.1 Fundamental Android UI Design
4.3.2 Working with Views and Layouts, Drawable Resources
4.3.2 Resolution and Density Independence
4.3.4 Working with Menus and Messages
4.3.5 Building Rich User Interfaces-Animations, Canvas, Surface View and Interactive controls

4.4 Working with Intents, Broadcast Receivers, Adapters and The Internet (4)
4.4.1 Intents, Intent filters, Linkify, Event broadcasting, Pending Events
4.4.2 Native Adapters and their usage
4.4.3 Connecting and using Internet Resources
4.4.4 Dialog classes-Alert Dialog, specialist Input dialogs, Using Activities as Dialogs, Managing and displaying Dialogs

4.5 Files, Saving States and Preferences (4)
4.5.1 Saving Simple application Data
4.5.2 Creating and saving preferences, Retrieving Shared Preferences
4.5.3 Preference activity and Preferences Frmework
4.5.4 Saving Activity State, Saving and Loading Files, Including Static Files as Resources
4.5.5 File Management tools

4.6 Database and Content Providers (3)
4.6.1 Android Databases-Working with SQLite Databases
4.6.2 Content Providers- Creating and using Content Providers

4.7 Audio, Video and Using the Camera (4)
4.7.1 Playing and recording Audio and Video
4.7.2 Working with the Camera
4.7.3 Working with Media and MediaStore

4.8 Deploying Android Application

4. Development tool

8.1 Self Study – PhoneGap

References:

1	Principles of Mobile computing, 2nd Ed	Uwe Hansmann, Lother Merk, Martin S. Nicklous, Thomas Stober	Springer Publication, 2004
2	Professional Android 2 Application Development	Reto Meier	WROX Publication-Wiley-India, 2009
3	J2ME: The Complete Reference	James Edward	Keogh Osborne Publication, 2009
4	Inside Microsoft Windows CE	John Murray	Microsoft Press 2007
5	The Symbian OS Architecture Sourcebook: Design and Evolution of a Mobile Phone OS	Ben Morris	Wiley Publications, ISBN 978-0-470-01846-0, 2007
6	Beginning Java ME Platform (Beginning from Novice to Professional) 3rd Edition	Ray Rischpater	Apress Publication 2008
7	Android Essentials	Chris Haseman	Apress Publication, 2009
8	Beginning Android	Mark L Murphy	Wiley India Pvt Ltd, 2009
9	Pro Android	Sayed Y Hashimi and Satya Komatineni	Wiley India Pvt Ltd, 2009
10	Android Wireless Application Development	2nd ed., Lauren Darcey and Shane Conder	Pearson Education,2011

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

M.Sc. Computer Application (M.Sc.(CA))

2nd Year - Semester III

Syllabus for

Paper No : 303

Paper Title : Software Testing **[Lect:4 Hrs]**

Aim: To provide an in-depth knowledge of Software Testing and Industrial practices in it.

Prerequisites: Basic understanding of Programming and Software Engineering

Expected Outcome: After completion of this course, the student will be capable of implementing the concepts, methods and tools of software testing

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1. Software Testing

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

2. Testing Techniques

2.1. White-Box and Black-Box Testing
2.2 Static Black-Box Testing-Testing the specification
- 2.4.1 High Level Specification Review
- 2.4.2 Specification attributes Checklist
- 2.4.3 Specification Terminology Checklist

2.3 Dynamic Black-box Testing
- 2.3.1 Test-to-Pass and Test-to-Fail
- 2.3.2 Equivalence Partitioning
- 2.3.3 Data Testing-Testing for Boundary conditions, Sub-Boundary conditions, Default, Empty, Null, Zero, None, Invalid, Wrong, Incorrect, Garbage Data

2.3.4 State Testing-Testing Software's Logic flow, Testing states to Fail
2.3.5 Orthogonal Array Testing
2.4 Static White-Box Testing – Code Examination
- 2.4.1 Formal Code Reviews –Peer Reviews, Walkthroughs, Inspections
- 2.4.2 Examining adherence to coding standards and guidelines
- 2.4.3 Generic Code Review Checklist-Data Reference errors, Data Declaration Errors, Computation Errors, Control Flow Errors, Comparison errors, Subroutine Parameter Errors, Input/Output Errors, Other checks

2.5 Dynamic White-Box Testing
- 2.5.1 Data coverage-data flow, Sub-boundaries, Formulas and Equations, Error forcing

2.5.2 Code coverage-program statement and Line coverage, Branch coverage, condition Coverage, Control Flow

2.5.3 Unit and Integration Testing

2.6 Debugging- Process, Considerations, Debugging Approaches

2.7 Functional Testing, Ad-hoc Testing

2.8 System Testing - Stress, Load, Performance, Security, etc.

2.9 Acceptance Testing

3. Other Testing

3.1 Usability Testing

3.3.1 User Interface Testing - user interface standards and guidelines, intuitiveness, consistency, Flexibility, Comfort, Correctness, Usefulness

3.3.2 Testing for the Disabled: Accessibility Testing

3.2 Testing the Documentation

4 Testing of Web Application

4.1. Testing Concepts for WebApps

4.2. The Testing process

4.3. Content Testing

4.4. User Interface Testing

4.5. Component Level Testing

4.6. Navigation Testing

4.7. Configuration Testing

4.8. Security Testing

4.9. Performance Testing

5 Testing Tools

5.1 Automation of Test Execution, Requirement tracking, High Level Review

5.2 Types of Test Tools

5.2.1 Tools for test management and Control, Test Specification, Static Testing, Dynamic Testing, Non functional testing

5.3 Selection and Introduction of Test Tools

5.3.1 Tool Selection and Introduction, Cost Effectiveness of Tool Introduction

6. Test Design

6.1. Test Design Factors

6.2. Characteristics of Testable Requirements

6.3. Test Design Preparedness Metrics

6.4. Test Case Design Effectiveness

7. Test Recording and Reporting

7.1 A Bug's Lifecycle

7.2 Bug Reporting guidelines

7.3 Reporting for reproducibility

7.4 Reporting Severity and Priority of each bug.

7.5 Test Incident Report

7.6 Bug Tracking System- Manual and Automated

8 Self Study : Open Source & Proprietary/Commercial Tools for

8.1 Test Management

8.2 Functional Testing

8.3 Load & Performance Testing

References:

1	Software Testing	Ron Patton	Techmedia Publication, 2000
2	Software Testing and Quality Assurance	Kshirasagar Naik and Priyadarshi Tripathy	WILEY
3	Software Engineering A practitioner's approach	Roger S Pressman	McGraw Hill
4	Effective Methods for Software Testing	William E. Perry	WILEY
5	Software Testing Tools	Dr. K.V.K.K Prasad	dreamtech,2006
6	Software Testing Foundations	Andreas Spillner, Tilo Linz, Hans Schaefer	Shoff Publishers and Distributors
7	Software Testing: Principles and Practices	Srinivasan D and Gopalswamy R	Pearson Education, 2006
8	Foundations of Software Testing	Aditya P. Mathur	Pearson Education custom edition 2000
9	Software Engineering Concepts	Fairley R E	Mc-Graw Hill
10	Software Engineering	Lewis T G	Mc-Graw Hill
11	Fundamentals of Software Engineering	Carlo Ghezzi	-
12	IEEE standard for software user documentation	-	std 1063-1987
13	Software Engineering- A programming approach	D. Bell, I. Morrey	PHI
14	Pragmatic Software Testing	Rex Black	WILLEY
15	Software Testing Concepts and Practices	K. Mustana and R.A. Khan	Narosa Pub
16	Testing Object Oriented Systems: models, patterns and tools	Robert V Binder	Addison Wesley, 1996
17	The art of software testing	GJ Myers	Wiley
18	Software Quality Asurance	Milind Limaye	McGrawHill Publication, 2011

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

M.Sc. Computer Application (M.Sc.(CA))

2nd Year - Semester III

syllabus for

Paper No: 304 - Elective 1 **[Lect: 4 Hrs.]**

Paper No: 305 - Elective 2 **[Lect: 4 Hrs.]**

NOTE : Any two papers from the following papers to be selected as paper :304 and paper:305.

A) Cloud Computing
B) Distributed Databases
C) Multimedia Systems
D) Expert Systems

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

M.Sc. Computer Application (M.Sc.(CA))

2nd Year - Semester III

syllabus for

Elective A : Cloud Computing **[Lect: 4 Hrs]**

Aim: To provide comprehensive knowledge of Cloud based systems and aspects related to it.

Prerequisites: Basic understanding of Types and Categories of Information Systems, Web and Web based Application Development.

Expected Outcome : After completion of this course, the student will gain comprehensive knowledge of of Cloud based systems and aspects related to it.

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1. **Evolution of Cloud Computing**
   - 1.1 Introduction to Web Services-SOAP, WDL, UDDI, characteristics, benefits and impact on EDI
   - 1.2 Introduction to Web 2.0 and Web 3.0
   - 1.3 SOA Fundamentals - Evolution, characteristics of SOA, Basic SOA architecture, infrastructure services, SOA Enterprise Software models
   - 1.4 Evolution of Cloud Computing
   - 1.5 Virtualization

2. Fundamentals of Cloud
   - 2.1 Cloud characteristics-On Demand Service, Ubiquitous Network Access, Location Independent Resource Pooling, Rapid Elasticity.
   - 2.2 Cloud Benefits and Barriers
   - 2.3 Cloud Types-Public, Private, Hybrid, Community, Shared Private, Dedicated Private
   - 2.4 Security in public cloud - Multi-tenancy, Security Assessment, Shard Risk, Staff Security Screening, Distributed Data Centers, Physical Security, Policies, Coding, Data Leakage.

3. Cloud Service Models
   - 3.1 Infrastructure as a Service
     - 3.1.1. Server virtualization
     - 3.1.2. Storage virtualization
     - 3.1.3. Network virtualization
   - 3.2 Platform as a Service (PaaS)
     - 3.2.1. Azure
     - 3.2.2. Goole AppEng
     - 3.2.3. Hadoop
     - 3.2.4. SalesForce
   - 3.3 Software as a Service (SaaS)-Characteristics, Open SaaS and SOA
     - 3.3.1. Cloud services

3.3.2. Web portal
3.3.3. Web OS
3.4 Identity as a Service(IDaaS)
3.4.1. Network Identity Service Classes
3.4.2. IDaaS Interoperability-user authentication, Aothorization MarkUp Languages
3.5 Compliance as a Service(CaaS)

4. **Cloud Computing Essentials**
4.1 Cloud Computing Architectural Framework
4.2 Cloud Deployment Models
4.3 Virtualization in Cloud Computing
4.4 Parallelization in Cloud Computing
4.5 Security for Cloud Computing

5. Cloud Based Systems
5.1 Cloud Based Storage
5.1.1. Provisioning Cloud Storage – Unmanaged and Managed cloud storage, creating cloud storage systems, virtual storage containers.
5.1.2. Cloud Backup solutions-types, features, cloud attached backups.
5.1.3. Cloud storage Interoperability-Cloud Data Management Interface(CDMI), Open cloud Computing Interface(OCCI)
5.2 Cloud Based Productivity Software
5.2.1. Productivity applications and Characteristics
5.2.2. Online Office systems-Acrobat.com, Google Docs, Microsoft Office Web apps etc.
5.3 Cloud based Webmail Services
5.3.1. Cloud Mail Services-Google Gmail, Windows Live Hotmail, Yahoo! Mail, Mail2Web.
5.3.2. Syndication services- RSS an Atom protocols, NewsReaders, News Aggregators
5.4 Cloud based Communicating systems
5.4.1. Instant Messaging clients, Interoperability, Micro-blogs or Short Message Services
5.4.2. Collaboration Technologies
5.4.3. Social Networks for communication
5.5 Cloud based Media and Streaming
5.5.1. Introduction to Streaming Process and Protocols
5.5.2. Audio Streaming , VoIP applications-Skype, Google Voice, Google Talk
5.5.3. Video Streaming formats, Television based streaming, Youtube.

6. **Mobile Cloud**
6.1 Using Smartphones with the cloud-Android, Apple iPhone, BlackBerry
6.2 Mobile Interoperability
6.3 Performing Service Discovery
6.3.1. Context Aware Services
6.3.2. MEMS

6.3.3. Location awareness
6.3.4. Push services
6.4 Short Message Service(SMS)
6.5 WAP and Other Protocols
6.6 Performance synchronization

References:

1	Cloud Computing: Principles and Paradigms	R. Buyya et al. (eds.)	Wiley, 2010
2	Cloud Computing: Principles, Systems and Applications	L. Gillam et al. (eds.)	Springer, 2010
3	Cloud Computing Bible	Sosinsky	Wiley-India,2011
4	Cloud Computing-second edition	Dr. Kumar Saurabh	Wiley-India, 2012
5	Service-Oriented Architecture: Concepts, Technology, and Design	Thomas Erl	Prentice Hall Publication, 2005
6	Understanding Enterprise SOA-Enterprise Service Oriented Architecture	Eric Pulier, Hugh Taylor	dreamtech Press, 2008
7	Cloud Computing-Insight into New-Era Infrastructure	Dr. Kumar Saurabh	Wiley-India, 2012
8	Understanding SOA with Web Services	Sanjiva Weerawarana, Francisco Curbera, Frank Leymann, Tony Storey, Donald F.Ferguson, .Eric Newcomer, Greg Lomow	Addison Wesley Publication, 2004
9	Enterprise Service Bus	Dave Chappell	O'Reilly Publications, 2004

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

M.Sc. Computer Application (M.Sc.(CA))

2nd Year - Semester III

Proposed Syllabus for

Elective B : Distributed Database Management System **[Lect : 4 Hr.]**

Aim: To provide comprehensive knowledge of Distributed Database Systems and aspects related to it.

Prerequisites: Deep understanding of Database Management System concepts, Database Design, Database Management, Database Storage, Querying and Query Processing, Query Evaluation and Optimization and Object Oriented Concepts

Expected Outcome : After completion of this course, the student will gain comprehensive knowledge of Distributed Database Systems and aspects related to it..

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1. Introduction

1.1 Distributed data processing, What is a DDBMS?
1.2 Advantages and disadvantages of DDBMS.
1.3 Problem areas, Overview of database and computer network concepts

2. Distributed database Management System

2.1 Architecture
2.2 Transparencies in a distributed DBMS,
2.3 Distributed DBMS architecture Global directory issues

3. Distributed Database Design

3.1 Alternative design strategies
3.2 Distributed design issues
3.3 Fragmentation, Data allocation

4. Query Processing Issues

4.1 Objectives of query processing, Characterization of query processors
4.2 Layers of query processing, Query decomposition
4.3 Localization of distributed data

5. Optimizing Distributed Queries

5.1 Factors governing query optimization
5.2 Centralized query optimization, Ordering of fragment queries
5.3 Distributed query optimization algorithms

6. Distributed Object Management

6.1 Object model features
6.2 Fundamental object management issues

6.3 DOM architectures
6.4 Object caching, Object clustering, Object migration
6.5 Distributed object base systems

7. Query Processing In Distributed Object base Systems

7.1 Problems in accessing distributed objects
7.2 Distributed object assembly problem
7.3 Strategies for distributed object assembly

8. Transaction Management

8.1 The concept of 'transaction'
8.2 Goals of transaction management, Characteristics of transactions
8.3 Taxonomy of transaction models

References:

1	Principles of Distributed Database Systems	M.T. Özsu and P. Valduriez	Prentice-Hall [ISBN 978-0-470-40745-5]
2	Principles of Distributed Database Systems, 3rd edition	M. T. Özsu and P. Valduriez	Springer, 2011; ISBN 978-1-4419-8833-1
3	Distributed Object Management. By Morgan-Kaufmann	M.T. Özsu, U. Dayal and P. Valduriez (editors)	[ISBN: 9781558602564]
4	Distributed Databases Principles and Systems	S. Ceri and G. Pelagatti	McGraw Hill Book Company [ISBN:0-07-010829-3]
5	Oracle 9i Distributed Database Replication Manual	-	-
6	Modern Database Systems - The Object Model, Interoperability, and Beyond	W. Kim (editor)	ACM Press
7	Advances in Object-Oriented Database Systems	A. Dogac, M.T. Özsu, A. Billiris, and T. Sellis (editors)	Springer-Verlag
8	Object Oriented Database System – Approaches & Architectures	C.S.R. Prabhu	(PHE Pub.)
9	Fundamentals of Database System 3rd edition	Eliniskv & Navathe	Addison Welsey
10	Database Management Systems	Raghu Ramakrishnan & Johannes Gehrke	McGraw Pub

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

M.Sc. Computer Application (M.Sc.(CA))
2nd Year - Semester III
Proposed Syllabus for

Elective C: Multimedia Systems **[Lect : 4Hr]**

Aim: The aim of this course is to provide knowledge of the basic concepts and techniques related to Multimedia System.

Prerequisites: Students should be familiar with basics of computer graphics and multimedia.

Expected Outcome : After completion of this course, the student will gain knowledge of basic concepts and techniques related to Multimedia System.

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1. Computer graphics

- 1.1 Fundamentals
- 1.2 Vector graphics
- 1.3 Shapes
- 1.4 Transformations and Filters
- 1.5 3-D Graphics
- 1.6 Bitmapped graphics
- 1.7 Resolution
- 1.8 Image Compression
- 1.9 Image Manipulation
- 1.10 Geometrical Transformation
- 1.11 Combining Vectors and Bitmaps
- 1.12 File Formats

2. Video

- 2.1 Digitizing Video
- 2.2 Video Standards
- 2.3 Video Compression techniques
- 2.4 Digital Video Editing and Post-Production
- 2.5 Streamed Video and Video Conferencing

3. Animation

- 3.1 Captured Animation and Image Sequences
- 3.2 'Digital Cel' and Sprite Animation
- 3.3 Key Frame Animation
- 3.4 3-D Animation

4. Sound

- 4.1 The Nature of Sound
- 4.2 Digitizing Sound
- 4.3 Processing Sound
- 4.4 Compression

4.5 Formats
4.6 MIDI
4.7 Combining Sound and Picture

5. Distributed Multimedia System

5.1 Introduction to DMS
5.2 Main Features of DMS
5.3 Resources Management of DMS
5.4 Networking
5.5 Multimedia Operating System
5.6 Distributed Multimedia Servers
5.7 Distributed Multimedia Application

6. Multimedia Data Compression

6.1 Data Compression Terminology
6.2 A Classification of Data Compression Terminology
6.3 Data Compression Technology
6.4 Compression Standards

References:

1	Digital multimedia 3/e illustrated	Chapman, Nigel P. Chapman, Jenny Chapman	Wiley, 2009 ISBN : 0470512164, 9780470512166
2	Multimedia – making it work	Tay Vaughan	Tata McGraw – Hill ISBN : 0-07-463953-6
3	Streaming Multimedia – Bible	Steve Mack	John Wiley ISBN : 81-265-0290-8
4	Multimedia Communication System	LPE Pearon	Education Publication

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

M.Sc. Computer Application (M.Sc.(CA))

2nd Year - Semester III

Proposed syllabus for

Elective D: Expert System [Lect : 4Hr]

Aim: The aim of this course is to provide knowledge of the basic concepts and techniques of Expert System.

Prerequisites: Students should be familiar with Advance computing, algorithms and data structures

Expected Outcome : After completion of this course, the student will gain knowledge of basic concepts and techniques of Expert System.

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1. Introduction to AI
    - 1.1. Overview of AI and its application area
    - 1.2. Automated reasoning & Theorem proving, Natural Language, Understanding & Semantic modeling, Modeling Human performance
    - 1.3 AI problem characteristics
2. Knowledge Overview
    - 2.1. Definition and importance of knowledge
    - 2.2. Overview knowledge representation
        - 2.2.1 Structured Knowledge- Associative networks, Frame structures , Conceptual dependencies and Scripts
    - 2.3. Overview of knowledge organization
    - 2.4. Overview of knowledge search and manipulation
        - 2.4.1 Search techniques - Uninformed search, Informed search
        - 2.4.2 Introduction to matching Techniques
    - 2.5. Overview of Knowledge acquisition
    - 2.6 Knowledge learning types
    - 2.7 General learning models
3. Inference
    - 3.1 Introduction
    - 3.2 Trees, Lattices and Graphs
    - 3.3 Deductive logic
    - 3.4 Rules of Inference
    - 3.5 Resolutions
    - 3.6 Forward and backward chaining
4. Reasoning under Uncertainty
    - 4.1 Uncertainty
    - 4.2 Errors and Induction
    - 4.3 Probability
    - 4.4 Temporal Reasoning and Backward Induction
    - 4.5 Uncertainty in inference chain

4.6 Uncertainty and Rules
4.7 Approximate reasoning

5. Expert System
   5.1 Overview of Expert System
   5.2 Characteristics of an Expert System
   5.3 Development of Expert System and Technology
   5.4 Expert System Application and Domain
   5.5 Elements of an Expert System
   5.6 Production system
   5.7 Artificial Neural System

6 Design of Expert System
   6.1 Stages in development of an Expert System
   6.2 Software Engineering and Expert System
   6.3 The Expert System Life Cycle
   6.4 Expert System Life Cycle Model

7 Expert System Architecture
   7.1 Overview of expert System Tools
   7.2 Expert System Shells
   7.3 Black Board Architecture
   7.4 Truth Maintenance Architecture System
   7.5 Rule Induction by Machine Learning

References:

1	Expert Systems: Principles and Programming	Joseph C. Giarratano, Gary D. Riley	Course Technology
2	Introduction to Expert Systems	Peter Jackson	Addison Wesley Publishing Company
3	Artificial Intelligence: A Modern Approach (Second Edition)	Stuart Russell and Peter Norvig	-
4	Introduction to Artificial Intelligence and Expert Systems	Dan W. Patterson	PHI
5	Foundation of Artificial Intelligence and Expert Systems	V.S. Janakiraman, K. Sarukesi, P. Gopalakrishnan	MacMillan, (2002)
6	Introduction of Artificial Intelligence	Charniak, E.	Narosa Publishing House

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

M.Sc. Computer Application (M.Sc.(CA))

2nd Year - Semester III

syllabus for

Paper No : 306

Paper Title : Practical on Advanced PHP Programming **[Pract:4 Hrs]**

Aim: The aim of this course is to enable students to develop web applications in PHP.

Prerequisites: Programming Skill in Structured and Object Oriented Programming, Scripting Skills in HTML, Basics of Operating Systems, Networks and Database systems, Concepts of Web, HTTP etc.

Expected Outcome : After completion of this course, the student will be capable of developing professional web applications using PHP.

The students will be required to carry out practical in Web Application Development on the topics covered in Paper 301: "Advanced PHP Programming" using the methods and tools discussed there in.

A Journal must be prepared for the practical work done.

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

M.Sc. Computer Application (M.Sc.(CA))

2nd Year - Semester III

syllabus for

Paper No : 307

Paper Title : Practical on Mobile Programming **[Pract:3 Hrs]**

Aim: The aim of this course is to enable students to develop applications for Mobile devices.

Prerequisites: Programming Skill in Structured and Object Oriented Programming, Scripting Skills in HTML, Basics of Operating Systems and Database systems, Concepts of Networks, Web, HTTP etc.

Expected Outcome: After completion of this course, the student will be capable of developing professional mobile applications using Android.

The students will be required to carry out practical in Mobile Application Development on the topics covered in Paper 302: "Mobile Application Development" using the methods and tools discussed there in.

A Journal must be prepared for the practical work done.

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

M.Sc. Computer Application (M.Sc.(CA))

2nd Year - Semester III

syllabus for

Paper No : 308

Paper Title : Practical on software Testing **[Pract:3 Hrs]**

Aim: The aim of this course is to enable students to Test desktop and Web Applications.

Prerequisites: Basic understanding of Programming and Software Engineering

Expected Outcome: After completion of this course, the student will be capable of performing various types of testing on Software and Web Applications.

The students will be required to carry out practical on software testing on the topics covered in Paper 303: "Software Testing" using the testing methods and tools discussed there in.

A Journal must be prepared for the practical work done.

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT

M.Sc. Computer Application (M.Sc.(CA))

2nd Year - Semester IV

syllabus for

Paper No. : 401

Paper Title: Project **[Pract: 2 students / hour / week]**

Aim: To expose students to industrial practices and activities of software engineering and train them about the same.

Prerequisites: Knowledge of Advanced Programming, Latest Technologies and Tools and Software Engineering

Expected Outcome: After completion of this course, the student will be capable to start professional career and/or research work in the field of Information Technology.

Entire semester is allocated for a full-time project work. All the students have to undergo a project preferably in an industry or any reputed institute. The students must prepare documentation of the project work done as per the software Engineering Guidelines. At the end of the semester, the students have to submit their project report in bounded form to the respective institution. The project presentation and viva – voice will be conducted on the basis of it.

The students have to submit the following reports to their respective institution:

1. **Project Joining Report**
2. **Appropriate name of the project**
3. **Monthly Progress Report duly sign by the concern external guide**
4. **Project Completion Certificate**
5. **Institution/College Certificate**
6. **Software Coding declaration…(if industry/organization doesn't permit students to submit the source code)**

   Without such reports student will not be allowed to appear in his/her final Project Presentation and Viva-Voice.

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
M.Sc. Computer Application (M.Sc.(CA))
2nd Year - Semester IV
syllabus for

Paper No. : 402
Paper Title: Seminar [Pract: 4 students / hour / week]

Aim: Additional knowledge building in the field of Information Technology using self-learning practice.

Prerequisites: Basic Knowledge of Software Engineering theories, activities , methods, techniques & tools

Expected Outcome: After completion of this course, the student will have gained some additional knowledge in the field of information technology by self learning practice.

In this paper students will have to select any topic related to information technology field– preferably based on the current trends and technologies for the seminar. Individual student is required to prepare a seminar report. At the end of the semester student has to submit seminar report with satisfactory detail study in the bounded form to the respective institution. The seminar presentation and viva voice will be conducted on the basis of selected topic at the end of the semester.

The students have to submit the following documents to their respective institution:

1. **Name and abstract of the Topic selected.**
2. **Monthly Progress Report duly signed by the concern internal guide**
3. **Work Completion Certificate by internal guide**
4. **Institution/College Certificate**