

**BHAGWANT UNIVERSITY**  
**Sikar Road, Ajmer**  
**Rajasthan**



**Syllabus**

**Institute of Computer Application**  
**M. Phil**  
**(Information Technology)**

## **ANNUAL SCHEME OF EXAMINATION:**

1. Every candidate shall be required to offer three written papers and one dissertation (equivalent to one paper). Within this frame work the Board of Studies shall recommend the course of study for the M. Phil examination.
2. The course of study for the M. Phil degree shall extend over a period of one academic year. There shall be a continuous internal assessment and as external assessment. The proportion of internal and external assessment shall be 30:70. There will be no internal assessment in the dissertation. Total marks for M. Phil will be 400. Dissertation may be written by the candidates under the supervision of any teacher who is registered as M. Phil Supervisor. Supervisor can guide normally five dissertations. However, the maximum limit may be relaxed by the permission of Vice-Chancellor on the recommendation of Head. The internal Supervisor can guide five candidates and workload of six hours is admissible for each M. Phil course for dissertation. The Supervisor will sign and issue a certificate counter signed by the Head of department concerned.
3. The internal assessment may be evaluated on the basis of:

(a) Mid Terms	:	15 Marks
(b) Assignments /Seminar Presentation /Group Discussion:		15 Marks
4. Each theory paper shall consist of 100 marks. The dissertation shall also consist of 100 marks. For a pass, a candidate shall be required to obtain (a) at least 40% marks in each paper separately (b) a minimum of 50% marks in the aggregate of all the papers prescribed for the examination. In the mark sheet, successful candidates shall be classified as under

First Division	65% or more.
Second Division	50-65%
- 6- A candidate will have to pass individually both in the Internal as well as external examination and it should be shown separately in the marks sheet.
- 7- The placement of every candidate under a Supervisor/Guide shall be decided within two months from the last date for admission.
- 8- A candidate who fails at the examination even in one paper/dissertation shall be required to reappear at the examination in a subsequent year in all the papers/dissertation prescribed for the examination, provided that a candidate who obtains at least 50% marks in dissertation shall be exempted from the submitting a fresh dissertation and the marks obtained by him shall be carried forward for working out his result.
- 9- For each theory paper 10 questions will be set for the final examination and the candidate will have to attempt at least five questions. All the questions will carry equal marks.
- 10- Workload distribution: There will be a teaching of four periods of one hour duration per week for each theory paper and six hours for dissertation.  
i.e. 4X3 = 12 hours for theory papers and six hours for dissertation per week.

Papers Number	Paper Code	Papers Name	Teaching Periods			Marks		
			L	T	P	External Marks	Total Internal Marks (Mid Term 15, Assignment-15)	G. Total
PAPER I	01MPL14101	Research Methodologies for Quality, relevant and consistent research	3	1	0	70	30	100
PAPER II	01MPL14102	Software Technologies	3	1	0	70	30	100
PAPER III	01MPL14103	Advance Networking and Security	3	1	0	70	30	100
	01MPL14201	Dissertation			6	100	0	100
		<b>TOTAL</b>	<b>9</b>	<b>3</b>	<b>6</b>	<b>310</b>	<b>90</b>	<b>400</b>

Paper I

### RESEARCH METHODOLOGIES

**Paper Code:** 01MPL14101

#### UNIT-1: Research Overview

Meaning of Research – Objectives of Research – Motivation in Research – Types of Research – Research Approaches – Significance of Research – research Methods versus Methodology – Research and Scientific Method – Importance of Knowing How Research is done – Research Process – Criteria of good Research – Necessity of Defining the Problem – Technique involved in Defining the Problem – Meaning of Research Design – Need for Research Design – Features of a Good Design – Important Concepts Relating to Research Design – Different Research Design – Data

#### UNIT-2: Data Analysis

Mathematical and statistical analysis using software tools like MAT Lab, SPSS or free wares tools.

Report writing and analyzed data representation - Significance of Report Writing – Different Steps in writing Report – Layout of the Research Report – Types of Reports – Oral Presentation – Mechanics of Writing a research Report – Precautions for Writing Research Reports.

#### UNIT-3: Quality Research Strategies

Building expertise in the areas of interest, generating the base content in the selected area, literature survey for research work- already done, being done by others and arriving at directions of research.

Formulation of research title , development of criteria based research proposal , Presentation for the research proposal and review of the proposal base on the feedbacks by evaluation experts.

Planning for the research work with outcomes/achievable and time targets.

Research monitoring publication of research outcomes in referred journals.

Documentation of research work to generate thesis with norms and standards.

## **Paper II**

### **SOFTWARE TECHNOLOGIES**

**Paper Code:** 01MPL14102

#### **UNIT-1. Software Management Concept**

- Software process
- Software project Metrics
- Software project Planning
- Risk Management

#### **UNIT-2. Software Quality Assurance**

- Quality Concepts
- Quality Movement
- Software Review
- Software Quality Assurance
- Formal Technical Reviews

#### **UNIT-3. Software Testing**

- Software Testing Fundamentals
- Test Case Design
- Basic path Testing
- Control Structure Testing
- A Strategic approach to software

#### **UNIT-4. Enterprise Application Integration**

- Concepts and challenges of integrating different application
- Different heterogeneous platform
- EAI architecture, EAI approaches data level
- Application / process level, method level

### **UNIT-5. Messaging concepts and services**

- Messaging concepts and various types of messaging services
- Middleware and adapter services, Transaction middle aware
- EAI process methodology

## **Paper III**

### **ADVANCED NETWORKING AND SECURITY**

Paper Code: 01MPL14103

#### **UNIT-1 Network Tools and Techniques**

- Protocol layering, system design, multiple access, switching, scheduling, naming, addressing, routing, error control; flow control
- Traffic management – data link layer protocols
- Internet: concept, history, network layer, transport protocol UDP, TCP, Ipv4, Ipv6

#### **UNIT-2 Local Area Networks, Socket and Interprocess communication**

- Topologies, access techniques, LAN, 802.11G wireless LANs.
- Application layer: DNS, Email, WWW, multimedia.
- TCP sockets, UDP sockets name and address conversion, IPv4 / Ipv6 interoperability - Socket programming.
- Posix IPC, system V IPC, Pipes, FIFO, Posix message queue,
- System V semaphore, RPC in Sun systems. Unix programming using IPe.

#### **UNIT-3 Classical Encryption, Block Cipher and the Data Encryption Standard**

- Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transportation Techniques, Rotor Machines, Steganography.
- Simplified DES, Block Cipher Principles, the Data Encryption Standard
- Block Cipher Design Principles and Modes of Operation
- Advanced Encryption Standard: Evaluation Criteria, the AES Cipher

#### **UNIT-4 Contemporary Symmetric Ciphers and Confidentiality using Symmetric Encryption**

- Triple DES, Blowfish, RC5,
- Characteristics of Advanced Symmetric Block Ciphers RC4 Stream Cipher.
- Placement of Encryption function, Traffic Confidentiality, Key

Distribution, Random Number generation.

### **UNIT-5 Introduction to Number Theory and Key Management**

- Prime Numbers, Fermat's and Euler's Theorems, Testing for Primality,
- The Chinese Remainder Theorem, Discrete Logarithms.
- Key Management, Diffie-Hellman Key Exchange, Elliptic Curve Arithmetic, Elliptic Curve Cryptography.
- Authentication applications – Electronic Mail Security, IP Security– Web Security – System Security : Intruders – Malicious Software – Firewalls

### **Paper IV**

### **M. Phil Dissertation**

**Paper Code:** 01MPL14201

Each student will submit dissertation on any one topic related to Information Technology. Dissertation will be guided by supervisor of the university and will be examined by external.

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