

Govt. Holkar Autonomous Science College, Indore – M.Phil. (Computer Science)

(As per Annexure - V of UGC Autonomy Guidelines)



**GOVT. HOLKAR AUTONOMOUS SCIENCE
COLLEGE INDORE
(CENTER FOR EXCELLENCE)**

2016-17 and onwards

Affiliated to Devi Ahilya Vishwavidyalaya, Indore

Syllabus for M.Phil.

Computer Science

(Faculty of Computer Science)

(As per Annexure - V of UGC Autonomy Guidelines)

DEPARTMENT OF COMPUTER SCIENCE

(As per Annexure - V of UGC Autonomy Guidelines)

General Rules for M.Phil. Computer Science

Session 2016-17

1) Course Name: M.Phil. Computer Science

2) Requirement: (a) M.Sc.(CS)/M.Sc(IT), MCA from any recognized university with at least 55% & (b) At HSC level and graduate level mathematics must be one of the subjects.

3) Mode of Admission: Through merit of written examination conducted by Holkar Science College, Indore remaining terms and Condition for admission will be same as described by M.P.Govt. Higher Education

4) Pattern of Examination: Multiple choice question paper. Question paper may include 50 or 100 questions. Question paper will be of 100 marks. At present no negative marking.

5) Duration of Course: One colander year with two semesters Course Module/pattern:

A) 1st Semester: Four following compulsory papers

S.NO	NAME OF SUBJECT	MARKS		
		Internal	External	Total
1	Review of Related Literature	-	100	100
2	Computer Application	15	85	100
3	Quantitative Techniques	15	85	100
4	Research Methodology	15	85	100
Grand Total = 400				

B) IInd Semester: Four following compulsory papers

S.NO	NAME OF SUBJECT	MARKS		
		Internal	External	Total
1	Network Security and Cryptography	15	85	100
2	Object Oriented Modeling and Technology	15	85	100
3	Seminar	25+25	50	100
4	Viva Voce	-	100	100
Grand Total = 400				

c) IIIrd Semester: This will include dissertation/thesis works. Students can work for their research project in any recognized institution under any guide /co- guide who has at least M.Phil. Degree (as per UGC Regulation 2009) and 3 year teaching and 3 year research experience.

S.No.	NAME OF SUBJECT	MARKS
1	Dissertation/Thesis	200
2	Comprehensive Viva Voce	100
3	Term Paper/ Assignment	50
4	Seminar	50
		Grand Total = 400

Total Marks of Semester-I + Semester-II + Semester- III =1200

Semester-I

M.Phil.(Computer Science)

2016-17

M.Phil.(Computer Science)

Course Work Syllabus as per

UGC Regulation 2009

Semester-I

**M.Phil.(Computer Science)
MPCS-101: Review of Related Literature**

MM: 100

Students must deeply review the literatures in specific research area of computer science and submit the summary of the same to the department through proper channel for evaluation.

UNIT- I

Computer Generations Von Neumann Machine Architecture, Functional Units and Components in Computer Organization. Computers – Block diagram, Basic components of a Digital Computer - Control unit, ALU, Memory, Uses of Program Development, Tool, Editor, Compiler, Assembler, Interpreter, Algorithm, Flowchart, Logic Development & Problem solving.

UNIT- II

Number systems – Decimal Number system, Binary number system and Hexa decimal number system, 1's & 2's complement. Codes, ASCII. Logic Gates, AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates. Counters, Registers, Shift Registers

UNIT- III

Documentation Using MS-Word - Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Advance Features of MS-Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation.

Presentation using MS-PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

UNIT- IV

Using Computers: Importing and exporting of computer data – a knowledge of .PDF and .html formats, using notepad/word pad, MS Access and Adobe PageMaker, basic knowledge of programming and data processing, Two dimensional and three dimensional plots, Using Excel and Origin for graphical representations and computation, using SPSS and Mat lab, using internet and search engines, using power-point / flash / video for making deliberations. Internet and Intranet: HTML, Web pages, creating a web page using MS Front page, adding graphics and images, Current web technologies. Hosting a web site. Advance search techniques, case studies:

Google & Yahoo and Google Scholar. Building an Intranet. Word Processing advance features helpful in preparing thesis in MS-Word

Data Analysis and Display: Facilities in MS Excel for Data analysis and display, What-if-analysis/ data analysis in worksheet using MS-Excel, Other data analysis and display software's, case study: Origin . Software for, Scientific and Statistical Analysis: Case studies: SPSS Database: Creating a Database and simple Querying, Graphics and Drawing: Adobe Photoshop: Basics (only Introductory, level), Image compression (GIF, JPEG, PNG formats), Multimedia, Digital Arts, Audio and Video formats, Multimedia Projections.

UNIT- V: The Research Reporting & Review of Literature

Preparation of synopsis and report, 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, Writing of a research paper, Literature collection (textual and digital resources), citation styles (Journals, book and reports), Manuscript preparation (data presentation, editing and proof correction), abstract preparation and abstracting services

Review of published research in the relevant field.

Books recommended

1. Learn Microsoft Office – Russell A. Shultz – BPB Publication
2. Donald R. Cooper and remela S. Schindler, Business Research Methods, Tata McGraw Hill publishing company limited, New Delhi, 2000.
3. C.R. Kothari, Research Methodology, Wishva Prakashan, New Delhi,
4. Donald H. McBurney, research methods, Thomson Asia Pvt. Ltd. Singapore, 2002
5. G.W. Ticehurst and A.J. Veal, Business research methods, Longman, 1999.
6. Ranjit Kumar, Research methodology, Sage Publications, London, New Delhi, 1999
7. Information Communication Technology by Tim Shortis.
8. Handbook of Communication and Social Interaction Skills By John

Unit-I

Use of quantitative method in research, Types and sources of data, Data analysis for specific type of data, Tabulation and graphical representation, Sampling techniques, measures of sampling tendencies. Primary and secondary data, graphical representation of data, measures of central tendency: Arithmetic mean, properties of arithmetic mean, merits and demerits of arithmetic mean, geometric mean, median and mode

Unit-II

Measures of dispersion: Range, quartile deviation, mean deviation, standard deviation, coefficient of dispersion, coefficient of variation, skewness.

Correlation and regression analysis: meaning of correlation, scatter diagram, Karl Pearson coefficient of correlation, regression coefficient, property of coefficient regression, angle between two lines of regression

Unit-II

Students T test, chi-square test, F test and Analysis of variance, Basic knowledge of computer Statistical Programs-Prism, Sigma plot, SPSS. Non parametric or free distribution tests, Testing of hypothesis for non-parametric data.

UNIT-III

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-IV

Statistical Models in Simulation : Advantages and Disadvantages of Simulation - Types of Models - Simulation of Queuing Systems - Other Examples of Simulation - Concepts in Discrete - Event Simulation – List Processing - History of Simulation Software - Simulation Packages - Trends in Simulation Software. Comparison of Two System Designs: Meta-modeling - Optimization via Simulation.

References:

- 1-High Performance liquid chromatography : Principles and Methods, Elena D. Katz, John Wiley & Sons Ltd.(2009)
- 2- GC/MS, A Practical User Guide : Marvin McMaster & Christopher McMaster, Wiley - VCH (1998).

UNIT- I: Introduction to research

Definition, objectives, motivation, types of research, Meaning of research problems, Sources of research problems, Criteria / characteristics of a good research problem, Errors in selecting a research problem, utility of research. qualities of a good researcher, Problems encountered by researchers in India, Lab safety.

UNIT- II: Sampling

1. Sampling techniques. Probabilistic and non –probabilistic samples.
2. Types of Sampling
3. Determination of optimal sample size.

UNIT- III: Data collection methods

1. Data: Primary data and Secondary data
2. Schedule (purpose, essentials, procedure, design),
3. Interviews questionnaires, Guidelines for Questionnaire design – electronic questionnaire design and surveys. observation, inferences
4. Case Study Method
5. Data relevance to intellectual property rights (IPR), bookkeeping.

UNIT- IV: Hypothesis

1. Meaning of hypothesis
2. Types of hypothesis
3. Hypothesis testing.

UNIT- V: The Research Report

The purpose of the written report – concept of audience – Basics of written reports. General aspects of scientific writing ,The integral parts of a report – the little of a report, the table of contents, the synopsis, the introductory section, method section, results section – discussion section – recommendations and Implementation section . Individual research proposal and Institutional proposal, Style of writing the report, Style of References, Essay (General article) writing, Paper Writing, Skill of poster and oral presentation

Books recommended

1. Donald R. Cooper and remela S. Schindler, Business Research Methods, Tata McGraw Hill publishing company limited, New Delhi, 2000.
2. C.R. Kothari, Research Methodology, Wishva Prakashan, New Delhi,
3. Donald H. McBurney, research methods, Thomson Asia Pvt. Ltd. Singapore, 2002
4. G.W. Ticehurst and A.J. Veal, Business research methods, Longman, 1999.
5. Ranjit Kumar, Research methodology, Sage Publications, London, New Delhi, 1999.

Semester-II

M.Phil.(Computer Science)

2016-17

M.Phil.(Computer Science)

As per UGC Regulation 2009

UNIT 1

Need of security, security approaches, principals of security, types of attacks, authentication basics, passwords, authentication token, certificate based authentications.

Unit-2

Cryptographic techniques: plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric cryptography, overview of steganography, key range and key size, possible types of attacks.

Unit:3

Symmetric key algorithms: algorithm types and modes, data encryption standard (DES), international data encryption (IDEA), RC5, Blowfish, Advanced encryption algorithm (AES), differential and liner cryptanalysis.

Unit:4

Asymmetric key algorithms: history and overview of asymmetric key algorithms. RSA algorithm, Digital signatures, Digital certificates, provides key management, PKIX model, public key cryptography standard (PKCD, XML, PKI and security).

Unit5:

Internet security protocol: secure socket layer (SSL), secure hypertext transfer protocol (SHTTP) time stamping protocol (TSP), secure electronic transaction (SET), SSL vs. SET, 3-D secure protocol, electronic money, E-mail security, WAP security.

Reference Books:

1. William Stallings, Cryptography and Network Security, PHI
2. Atul Kahate, “ Cryptography and Network Security”, TMH
3. Calabrese, Info security intelligence-cryptography principles appl., Cengage Learn

UNIT 1

Object Oriented Concepts and Modeling Techniques Modeling, objects and classes, Relationships, Inheritance, Association, aggregation, Containers, Delegation, Metadata, Abstract methods and Classes.

UNIT 2

Object modeling, Dynamic modeling, Events, Status, Scenarios, Event hate diagrams, Operations, State diagrams, Functional Models, Dataflow diagrams, Constraints specification, Relation of object, Functional and Dynamic models.

UNIT 3

Design Methodology: OMT methodology, Analysis, Overview of system design, Subsystem, concurrency, Common architectural frameworks designing algorithm, Design optimization, Implementation of control, Design of Associations, Object design, Class design, Comparison of design methodology with SASD, JSD and others.

UNIT 4

Implementation Programming style, Reusability, Extensibility, Programming in the large, Translating a design into an Implementation class definition, Object oriented Language features, Survey of object-oriented languages, Object storage and relation with database.

UNIT 5

Advanced Topics Distributed objects, Components development, Introduction to Distributed object system like CORBA, EJB, COM+, DCOM, and other design architectures.

References:

1. G. Booch, Object-Oriented Analysis and Design, Pearson Education.
2. J. Rumbaugh, Object-Oriented Modeling and Design, Pearson Education