

PERIYAR E.V.R. COLLEGE (AUTONOMOUS)

TIRUCHIRAPPALLI – 620023

M.Phil. Computer Science (Part Time & Full Time) Programme
(For the candidates admitted from the academic year 2018 – 2019 onwards)

1. Part-I	Title of the Course	Marks			Credits
		IA	UA	Total	
Course I	Research Methodology	40	60	100	4
Course II	Advanced Concepts in Computer Science - I	40	60	100	4
Course III	Advanced Concepts in Computer Science - II	40	60	100	4
Course IV	Teaching and Learning Skills	40	60	100	4
2. Part-II					
	Dissertation and Viva – Voce			200	8
	(Dissertation –	150 Marks)			
	(Viva-Voce –	50 Marks)			
3. For each Course other than the Dissertation				100 Marks	
(a) Continuous Internal Assessment (CIA)	–	40 Marks			
CIA Components for Course I to IV					
Tests (2 x 10)	–	20 Marks			
Assignment	–	10 Marks			
Seminar	–	10 Marks			
(b) End Term Examination	–	60 Marks			
4. Question Paper Pattern for Course I to IV					
(a) Questions: 5(Either/Or Type) Questions				5 x 12 = 60 Marks	

Course I – RESEARCH METHODOLOGY

Scope and Objective: To impart the basic concepts on formal languages and Automata, which are required for research and to give knowledge on research types and thesis writing.

UNIT I

Thesis Writing: Literature Survey – Writing Reviews and Journal Articles – Publication of Papers – Planning a Thesis – General Format – Page and Chapter Formats – Footnotes – Tables and Figures – References and Appendices.

UNIT II

Analysis of Algorithm: The Role of Algorithm in Computing – Case Study: An analysis of Insertion Sort – Analyzing and Designing Algorithms – Growth of Functions – Asymptotic notation – properties.

UNIT III

Mathematical Logic: Logical statement of Proposition – Types of Propositions – The Propositional Calculus – Negation of a Proposition – Disjunction – Conjunction – Tautologies and Contradictions – Logical Equivalence – The Algebra of Propositions – Conditional Propositions – Converse, Inverse and Contrapositive Propositions – Negation of a Conditional Proposition – Biconditional Propositions – Arguments.

UNIT IV

Probability: Probability – Conditional Probability – Bayes Theorem: Measures of central tendency – Variance – Coefficient of variation – Correlation – Regression.

UNIT V

Sampling Theory and Testing of Hypotheses: Types of Samples – Parameter and Statistic – Tests of Significance – Procedure for Testing Hypothesis – Applications of t-test – t-test for Single Mean – Paired t-test for difference of means – F-test for equality of two population variances – Analysis of variance – Assumptions – Technique of Analysis of Variance – One Way Classification Model – Two Way Classification Model – Case Study: SPSS Software.

References

1. Janathan Anderson, Berry H. Durston, Millicent Poole, “*Thesis and Assignment Writing*”, Wiley Eastern Limited, 1992.
2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, “*Introduction to Algorithms*”, PHI, Third Edition, 2010.
3. S.P. Gupta, “*Statistical Methods*”, Sultan Chand & Sons Publishers, New Delhi, Fortieth Revised Edition, 2011.
4. B.S.Vatssa, “*Discrete Mathematics*”, Wishwa Prakashan Publishers, A Division of Wiley Eastern Ltd., Third Edition, 1993.

Course II – ADVANCED CONCEPTS IN COMPUTER SCIENCE – I

Scope and Objective: To impart the knowledge on some of the advance topics in Computer Science such as Formal Languages and Automata, Artificial Intelligence, Biometrics, Distributed Databases and Parallel Processing:

UNIT I

Formal Languages and Automata: Context free grammars – Derivation trees – Simplification of Context Free Grammars – Chomsky Normal form – Greiback Normal form – pumping lemma for Context Free Languages. Finite state systems: Basic definitions – Non-deterministic finite automata – Finite automata with ϵ move – Regular expressions.

UNIT II

Artificial Intelligence: Generate and Test – Hill climbing – Best–First Search – Depth–First Search – Problem reduction – Constraint satisfaction – Means–Ends analysis. Predicate Logic: Representing simple facts in Logic – Representing Instance and Isa Relationships – Computable Functions and Predicates – Resolution – Natural Deduction.

UNIT III

Biometrics: Finger Print/Hand/Facial: Finger Print cards – manual matching of Fingerprints – template Extraction and size – The technology of Hand Geometry – Uses of Hand Geometry. Eye Biometrics: Iris Scanning and Retina Scanning. Biometrics and the feasibility of a National ID Card – Biometric tool.

UNIT IV

Distributed Databases: Introduction – Distributed Database Architecture – Distributed Database Design – Distributed Transaction Management – Concurrency Control – Distributed database management systems.

UNIT V

Parallel Processing: Fundamentals of Parallel processing – Multiprocessors and Multicomputers – Multivector and SIMD Computers – MIMD computers or Multiprocessor.

References

1. John E. Hopcroft, Jeffery D. Ullman, “*Introduction to Automata Theory Language and Computation*”, Narosa Publishing House, 1979.
2. Elaine Rich & Kevin Knight, “*Artificial Intelligence*”, Tata–McGraw Hill, 2nd Edition, 1992.
3. John D. Woodward, Jr., Nicholas M. Orlans, Peter T. Higgins “*Biometrics –The ultimate Reference*”, Dreamtech Press, 2003.
4. M.Tamer OZ Su and Patrick Valduriez, “*Principles of Distributed Systems*”, Second Edition, Prentice Hall International Inc, 1999.
5. Kai. Hwang, “*Advanced Computer Architecture*”, Tata Mcgraw Hill Publishing Company Ltd., 2004.

Course III – ADVANCED CONCEPTS IN COMPUTER SCIENCE – II

Scope and Objective: To impart the knowledge on some of the advance topics in Computer Science such as Data Mining, Software Metrics, Data Compression, Digital Image Processing and Distributed Systems.

UNIT I

Data Mining: Functionalities: Classification of Data Mining Systems – Task Primitives – Integration of a Data Mining System with a Database or Data Warehouse System – Major Issues in Data Mining – Web and Temporal Mining: Web content Mining, Web Structure Mining, Web usage mining. Temporal Mining: Modeling Temporal Events, Times series, Pattern Detection, Sequences.

UNIT II

Software Metrics: Measurement in Software Engineering – Scope of Software Metrics – Representational Theory of Measurement and Models – Scales – Classification of Software Measures. Principles of Investigations: Planning Formal Experiments – Data Collection – Storing and Extracting-Analyzing the Results, Simple Analysis Techniques.

UNIT III

Compression Techniques: Lossy and Lossless Compression Methods - Mathematical Modelling for Lossless compression– Physical and Probability Models - Markov Model and Composite Source Models - Mathematical Modelling for Lossy Compression.

UNIT IV

Digital Image Processing: Edge Detection – Edge Linking – Hough Transform – Active Contour – Watershed Transformation – Shape Representation.

UNIT V

Distributed Systems: System Models – Physical models – Architectural models – Fundamental models. Indirect communication: Group communication - Publish-subscribe systems - Message queues.

References

1. Jiawei Han, Micheline Kamber, “*Data Mining: Concepts and Techniques*”, Morgan Kaufmann Publishers, Second Edition, 2006.
2. Noman E. Fenton and Shari Lawrence Pfleeger, “*Software Metrics*”, PWS Publishing Company, USA, Second edition 1996.
3. David salomon, “*Data Compression – The Complete Reference*”, Second Edition, Springer Publications.
4. S .Jayaraman, S.Esakkirajan, T.Veerakumar, “*Digital Image Processing*”, TMH,2008.
5. Kai. Hwang, “*Advanced Computer Architecture*”, Tata Mcgraw Hill Publishing Company Ltd, 2004.
6. George Coulouris et.al, ”*Distributed Systems*”, Addison Wesley, Fifth Edition, 2012.

Course IV – TEACHING AND LEARNING SKILLS

UNIT I – Computer Application Skills

Computer system: Characteristics, Parts and their functions – Different generations of Computer – Operation of Computer: switching on / off / restart, Mouse control, Use of key board and some functions of key – Information and Communication Technology (ICT): Definition, Meaning, Features, Trends – Integration of ICT in teaching and learning – ICT applications: Using word processors, spread sheets, Power point slides in the classroom – ICT for Research: On–line journals, e–books, Courseware, Tutorials, Technical reports, Theses and Dissertations.

UNIT II – Communication Skills

Communication: Definitions – Elements of Communication: Sender, Message, Channel, Receiver, Feedback and Noise – Types of Communication: Spoken and written; Non–verbal communication – Intrapersonal, Interpersonal, Group and Mass communication – Barriers to communication: Mechanical, Physical, Linguistic & Cultural – Skills of communication: Listening, Speaking, Reading and writing – Methods of developing fluency in oral and written communication – style, Diction and Vocabulary – Classroom communication and dynamics.

UNIT III – Communication Technology

Communication Technology: Bases, Trends and Developments – Skills of using Communication Technology – Computer Mediated Teaching: Multimedia, E–content – Satellite–based communication: EDUSAT and ETV channels, Communication through web: Audio and Video applications on the Internet, interpersonal communication through the web.

UNIT IV – Pedagogy

Instructional Technology: Definition, Objectives and Types – Difference between Teaching and Instruction – Lecture Technique: Steps, Planning of a Lecture, Delivery of a lecture – Narration in tune with the nature of different disciplines – Lecture with power point presentation – Versatility of lecture technique – Demonstration, Characteristics, Principles, Planning Implementation and Evaluation – Teaching – Learning Techniques: Team Teaching, Group discussion, Seminar, Workshop, Symposium and Panel Discussion – Models of teaching: CAI, CMI and WBI.

UNIT V – Teaching Skills

Teaching skill: Definition, Meaning and Nature – Types of Teaching skills: Skill of Set Induction, Skill of Stimulus Variation, Skill of Explaining, Skill of Probing Questions, Skill of Black Board writing and Skill of Closure –Integration of Teaching Skills – Evaluation of Teaching Skills.

References:

1. Bela Rani Sharma (2007), “*Curriculum Reforms and Teaching Methods*”, Swarup and sons, New Delhi.
2. Don Skinner (2005), “*Teacher Training*”, Edinburgh University Press Ltd., Edinburgh.
- 3.”*Information and Communication Technology in Education: A Curriculum for Schools and programme of Teacher development*”, Jonathan Anderson and Tom Van Weert, UNESCO, 2002.
4. Kumar K.I (2008) , “*Educational Technology*”, New Age International Publishers, New Delhi.
5. Mangal, S.K. (2002), “*Essential of Teaching – Learning and Information Technology*”, Tandon Publications, Ludhiana.
6. Michael D. and William (2000), “*Integrating Technology into Teaching and Learning: Concepts and Applications*”, Prentice Hall, New York.
7. Pandey S.K. (2005), “*Teaching Communication*”, Commonwealth Publishers, New Delhi.
8. Ram Babu A. and Dandapani S (2006) , “*Microteaching*” (Vol.1&2) Neelakamal Publications, Hyderabad.
9. Singh V.K. and Sudarshan K.N. (1996), “*Computer Education*”, Discovery Publishing Company, New York.
- 10.Sharma R. A. (2006), “*Fundamentals of Educational Technology*”, Surya Publications, Meerut
- 11.Vanaja. M. and Rajasekar S. (2006) , “*Computer Education*”, Neelkamal Publications, Hyderabad.