



M.Phil Computer Science (FT/PT) Programme

(For the candidates admitted from the academic year 2018-2019 onwards)



Semester	Course	Course Code	Title of the Course	Ins. Hours/ Weeks	Credit	Exam Hours	CIA (Max)	ESE (Max)	Total (Max)
I	Core Course – I	18MPCS1CC1	Research Methodology	6*	5	3	25	75	100
	Core Course – II	18MPCS1CC2	Advanced Concepts in Computer Science	6*	5	3	25	75	100
	Core Course – III	18MPCS1CC3	Teaching and Learning Skills (Common Paper)	6*	5	3	25	75	100
	Core Course – IV	18MPCS1CC4	Paper on Topic of Research (The syllabus will be prepared by the Guide and the examination will be conducted by the COE)	6*	5	3	25	75	100
	* One Hour Library hour for each Course								
			Total	24	20	12	100	300	400
II	Project Work	18MPCS2DW	Dissertation and Viva-Voce (Viva Voce 50 marks Dissertation 150 marks)	-	10	-	-	-	200
			Total	-	10	-	-	-	200
			Grand Total	24	30	12	100	300	600

SEMESTER – I
CORE COURSE 1 – RESEARCH METHODOLOGY

Course Code: 18MPCS1CC1
Hours: 6
Credit: 3

Total Marks : 100
External Marks: 75
Internal Marks: 25

UNIT I: UNIT I:

Overview of Research Methodology: Introduction– Meaning of Research – Objectives of Research – Motivation in Research –Types of Research – Research Approaches – Significance of Research –Research process- Data Collection and Data Preparation: Introduction - Collection of Primary Data - Collection of Secondary Data - Selection of Appropriate Method for Data Collection - Data Preparation Process.

UNIT II:

Test of Hypothesis: Introduction- What is Hypothesis? -Basic Concepts Concerning Testing of Hypotheses- Tests of Hypotheses - Hypothesis Testing for: Mean, Proportion, Variance - Chi-Square Test: Test of Independence of Attributes - Categorized Data- Test of Goodness of Fit-Nonparametric Tests: Introduction- One Sample Test - Two Sample Tests-K Samples Tests-Advanced Multivariate Analysis: Introduction– Factor Analysis-Discriminant Analysis-Cluster Analysis.

UNIT III:

Algorithmic Research: Introduction-Algorithmic Research Problems- Types of Algorithmic Research Problems-Types of Solution Procedure/Algorithm-Steps of Development of Algorithm-Steps of Algorithmic Research-Design of Experiments and Comparison of Algorithms-Meta Heuristics for Combinatorial Problems.

UNIT IV:

Thesis Writing: Literature Survey – Writing Reviews and Journal Articles – Publication of Papers –Planning a Thesis – General Format – Page and Chapter Format – Footnotes – Tables and Figures –References and Appendices-Report Writing and Presentation: Introduction - Significance of Report Writing - Different Steps in Writing Report - Layout of the Research Report - Types of Reports-Guidelines for Reviewing Draft-Oral Presentation.

UNIT V:

Research Tools: Introduction – SPSS – MATLAB – LaTeX – NS/2 –Rational Suite - Eclipse IDE.

Reference Books:

1. C. R. Kothari, Gaurav Garg, Research Methodology Methods and Techniques, NewAge International publishers, Third Edition, 2014.
2. Research Methodology – R.Panneerselvam, Prentice-Hall of India Private Limited, New Delhi-110 001, 2005.
3. Richard Johnson, Dean Wichern, Applied Multivariate Statistical Analysis. Prentice Hall (ISBN 0-1312-1973-1).
4. C Chatfield and A J Collins, Introduction to Multivariate Analysis. Chapman and Hall (SF 2 CHA).

SEMESTER – I
CORE COURSE I1 – ADVANCED CONCEPTS IN COMPUTER SCIENCE

Course Code: 18MPCS1CC2
Hours: 6
Credit: 3

Total Marks : 100
External Marks: 75
Internal Marks: 25

UNIT I:

DATA MINING AND DATA ANALYTICS: Introduction - Data Mining & Data Preprocessing – Mining Frequent Patterns - Classification – Cluster Analysis- Data Mining Trends and Research Frontiers. Self-Learning Practice: WEKA / Rapid Miner / DB Miner.

UNIT II:

CLOUD COMPUTING: Introduction – Companies Involved in Cloud Computing – Why Cloud Computing – Benefits of Cloud Computing – Cloud Computing Drawbacks – Major Components – Cloud Computing Issues – Cloud Services- Virtualization. Self-Learning Practice -VMware / Cloud Foundry / Open Stack. Globus Toolkit / Eucalyptus / Open Nebula.

UNIT III:

PARALLEL PROCESSING: Introduction – Parallel processing Architecture -Program Issue-Data Dependency Analysis- Shared Memory management- Thread based implementation- Using Parallelism Effectively-Self Learning Practice: CEPBA

UNIT IV:

EVOLUTIONARY COMPUTING: Origin- Evolutionary Algorithm-Representation, Mutation & Recombination-Fitness, Selection & Population Manage- Popular Evolutionary Algorithm Variants-Parameter Control- Constraint Handling-Evolutionary Robotics Self Learning Practice: MATLAB.

UNIT V:

CRYPTOGRAPHY: Basic Principles- Historical Cryptosystems – Theoretical versus Practical Security – Symmetric Encryption – Public-Key Encryption – Digital Signature Schemes – Key Management – Public Key Management-Self Learning Practice: GnuPG / KF Sensor/ Snort/ Net Stumbler- For Term Paper Writing: * Self Learning Practice – One Problem is given to the scholar they have to solve it in any one of the tool.

Reference Books:

1. Jiawei Han, Micheline Kamber, Jian Pei, "Data Mining: Concepts and Techniques", Third Edition, Elsevier, 2011
2. Ivanka Menken, "A Complete Guide to Cloud Computing", Art of Service, 2008

3. M.Sasikumar, Dinesh Shikhare and P.RaviPrakesh "Introduction To Parallel Processing",2014.
4. A.E.Eibe and J.E.Smith, "Introuction to Evolutionary Computing" 2015.
5. Keith M. Martin, "Everyday Cryptography: Fundamental Principles and Applications", Oxford University Press, 2012.

SEMESTER – I
CORE COURSE III – TEACHING AND LEARNING SKILLS

Course Code: 18MPCS1CC3
Hours: 6
Credit: 3

Total Marks : 100
External Marks: 75
Internal Marks: 25

Unit I : Computer Application Skills: 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 - ICT for Professional Development : Concept of professional development; institutional efforts for competency building; individual learning for professional development using professional networks, OERs, technology for action research, etc.

Unit II : Communications 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 : 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.

Unit IV : E- Learning, Technology Integration and Academic Resources in India Concept and types of e-learning (synchronous and asynchronous instructional delivery and means), m-learning (mobile apps); blended learning; flipped learning; E-learning tools (like LMS; software's for word processing, making presentations, online editing, etc.); subject specific tools for e-learning; awareness of e-learning standards- Concept of technology integration in teaching- learning processes; frameworks guiding technology integration (like TPACK; SAMR); Technology Integration Matrix- Academic Resources in India: MOOC, NMEICT; NPTEL; e-pathshala; SWAYAM, SWAYAM Prabha, National academic depository, National

Digital Library; e-Sodh Sindhu; virtual labs; eYantra, Talk to a teacher, MOODLE, mobile apps, etc.

Unit V : Skills of Teaching and Technology based assessment Teaching skills: 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- Technology for Assessment: Concept of assessment and paradigm shift in assessment; role of technology in assessment 'for' learning; tools for self & peer assessment (recording devices; e-rubrics, etc.); online assessment (open source software's; e-portfolio; quiz makers; e- rubrics; survey tools); technology for assessment of collaborative learning like blogs, discussion forums; learning analytics.

References :

1. Bela Rani Sharma (2007), Curriculum Reforms and Teaching Methods, Sarup and sons, New Delhi
2. Brandon Hall , E-learning, A research note by Namahn, found in: [www.namahn.com/resources/ .../note-e-learning.pdf](http://www.namahn.com/resources/.../note-e-learning.pdf), Retrieved on 05/08/2011
3. Don Skinner (2005), Teacher Training, Edinburgh University Press Ltd., Edinburgh
4. Information and Communication Technology in Education: A Curriculum for schools and programmed of Teacher Development, Jonathan Anderson and Tom Van Weart, UNESCO, 2002.
5. Jereb, E., & Šmitek, B. (2006). Applying multimedia instruction in elearning. *Innovations in Education & Teaching International*, 43(1), 15-27.
6. Kumar, K.L. (2008) Educational Technology, New Age International Publishers, New Delhi.
7. Learning Management system : https://en.wikipedia.org/wiki/Learning_management_system , Retrieved on 05/01/2016
8. Mangal, S.K (2002) Essential of Teaching – Learning and Information Technology, Tandon Publications, Ludhiana.
9. Michael, D and William (2000), Integrating Technology into Teaching and Learning: Concepts and Applications, Prentice Hall, New York.
10. Pandey, S.K (2005) Teaching communication, Commonwealth Publishers, New Delhi.
11. Ram Babu, A abd Dandapani, S (2006), Microteaching (Vol.1 & 2), Neelkamal Publications, Hyderabad.
12. Singh, V.K and Sudarshan K.N. (1996), Computer Education, Discovery Publishing Company, New York.
13. Sharma, R.A., (2006) Fundamentals of Educational Technology, Surya Publications, Meerut
14. Vanaja, M and Rajasekar, S (2006), Computer Education, Neelkamal Publications, Hyderabad.

SEMESTER – I
CORE COURSE IV – GUIDE PAPER

Course Code: 18MPCS1CC4
Hours: 6
Credit: 3

Total Marks : 100
External Marks: 75
Internal Marks: 25

Name of the Supervisor : Dr.S.Sivakumar
Name of the Scholar : Priyadharshini A
Title of the Course : Data Mining and Knowledge Discovery
Register Number : 19MCS01

UNIT-1

Data mining: Introduction: Motivation, Important, What kind of data?, functionalities, Patterns, classifications -Data warehouse and OLAP technology for data mining: Introduction-multidimensional data model, Architecture, implementation- Data pre-processing: Why?, Data cleaning, Integration & Transformation, Reduction.

UNIT-2

Primitives for data mining: what defines a data mining task?- Concepts description: Characterization and Comparison : what is concept description?, data generalization and summarization-based characterization, efficient implementation, mining class comparisons.

UNIT-3

Classification & Prediction:-Classification Algorithm: C4.5, Apriori, SVM, AdaBoost, kNN, Naive Bayes, CART - Cluster Analysis: what is CA?, Type of data in CA, Hierarchical methods, Density-based, Grid-based, Model based-Clustering Algorithm: K-Means, EM(expectation maximization), Pagerank.

UNIT-4

Mining complex types of data: Generalization & multidimensional analysis, Spatial Databases, Time-series & Temporal, Mining text databases, Multimedia databases, Mining in WWW.

UNIT-5

Data Mining Applications and trends in data mining: data mining applications, other themes on data mining, social impacts of data mining, trends & Research issues in data mining-Data Mining for Business Applications: Domain Driven KDD Methodology.

Reference Books:

1. Jiawei Han, Micheline Kamber "Data Mining: Concepts and Techniques"

2. "The Top Ten Algorithms in Data Mining" Edited by XindongWu, Vipin Kumar
3. LongbingCao, Philip.Yu,ChengqiZhang, Huaifeng Zhang "Data Mining for Business Applications"

SEMESTER – I
CORE COURSE IV – GUIDE PAPER

Course Code: 18MPCS1CC4
Hours: 6
Credit: 3

Total Marks : 100
External Marks: 75
Internal Marks: 25

Name of the Supervisor : Dr.V.Poongodi
Name of the Scholar : Rajamani K
Title of the Course : Cloud Computing and Software Services
Register Number : 19MCS02

Unit – I: Cloud Computing Fundamentals

Introduction- Layers of Cloud Computing- Types of Cloud Computing- Cloud Computing Versus Cloud Services- Enabling Technologies- Cloud Computing Features- Cloud Computing Platforms- Cloud Computing Challenges-Cloud Types –Cloud Services and Cloud Roles- Infrastructure as a Service- Platform as a Service- Software as a Service- The Amazon Family

Unit – II: Science Gateways

Science Gateways—Background and Motivation-Clouds and Software Services-Science Clouds, Public and Private –Eucalyptus - Open-Source IaaS - Engineering Challenge- Eucalyptus Architecture-Cloud Computing for Science - Nimbus Goals and Architecture - Science Clouds Applications - Nimbus Helps Meet STAR Production Demands - Building a Cloud Computing Ecosystem with CernVM - CloudBLAST: Creating a Distributed Cloud Platform -Architecture of an SaaS Science Gateway -Dynamic Provisioning of Large-Scale Scientific Datasets - Science Gateways for Data - Cloud Computing and Data

Unit-III: Enterprise Knowledge Clouds

Introduction - Enterprise Knowledge Management: Architecture and Technologies - Enterprise Knowledge Cloud- Real Cases and Applications of Cloud Computing -Cloud Computing: IT as a Service-Cloud Computing Security-Cloud Computing Model Application Methodology-Cloud Computing in Development/Test-Cloud-Based High Performance Computing Clusters-Use Cases of Cloud Computing

Unit-IV: Large-Scale Data Processing

Introduction -MapReduce - Programming Model -Implementation Sketch- Failure Handling Optimizations - GridBatch - DFS Extension -GridBatch Operator- MapReduce Implementation on a Cloud OS -What Is a Cloud OS? - Advantages Offered by a Cloud OS- Challenges Posed by Cloud OS -Advantages of Cloud MapReduce - Cloud MapReduce Architecture and Implementation - Architecture

Unit-V: Clustering

Introduction to Clustering Techniques-Points, Spaces, and Distances -Clustering Strategies- The Curse of Dimensionality- Hierarchical Clustering -Hierarchical Clustering in a Euclidean Space-Efficiency of Hierarchical Clustering-Alternative Rules for Controlling Hierarchical Clustering - K-means Algorithms- K-Means Basics - The Algorithm of Bradley, Fayyad, and Reina - The CURE Algorithm- Initialization in CURE - Completion of the CURE Algorithm - Clustering in Non-Euclidean Spaces- Clustering for Streams and Parallelism

References

1. Boroko Furht , Armando Escalante , "Hand Book of Cloud Computing " – Springer
2. Syed A. Ahson , Mohammad Ilyas , "Cloud Computing and Software Services"- CRC Press
3. Anand Rajaraman and Jeffrey D. Ullman, "Mining of Massive Datasets".

SEMESTER – I
CORE COURSE IV – GUIDE PAPER

Course Code: 18MPCS1CC4

Hours: 6

Credit: 3

Total Marks : 100

External Marks: 75

Internal Marks: 25

Name of the Supervisor : Dr.S.Yuvarani

Name of the Scholar : Vinotha T

Title of the Course : Data Mining

Register Number : 19MCS03

Unit-I:

Introduction: Basic Data Mining Tasks, Data Mining Issues, Data Mining Metrics, Data Mining from a Database Perspective.

Unit-II:

Data Mining Techniques: A Statistical Perspective on Data Mining, Similarity Measures, Decision Trees, Neural Networks, Genetic Algorithms.

Unit-III:

Classification: Statistical-Based Algorithms, Distance-Based Algorithms, Decision Tree-Based Algorithms, Neural Network-Based Algorithms, Rule-Based Algorithms, Combining Techniques.

Unit-IV:

Clustering: Similarity and Distance Measures, Hierarchical Algorithms, Partitional Algorithms, Clustering Large Databases, Clustering with Categorical Attributes.

Unit-V:

Association Rules: Basic Algorithms, Parallel and Distributed Algorithms, Incremental Rules, Advanced Association Rule Techniques, Measuring the Quality of Rules. Advanced Techniques : Web Mining, Spatial Mining, Temporal Mining.

Text Books

1. J. Han and M. Kamber. Data Mining: Concepts and Techniques, 2nd Ed. Morgan Kaufman. 2006.

References

1. M. H. Dunham. Data Mining: Introductory and Advanced Topics. Pearson Education.

2001.

2. I. H. Witten and E. Frank. Data Mining: Practical Machine Learning Tools and Techniques. Morgan Kaufmann. 2000.

3. D. Hand, H. Mannila and P. Smyth. Principles of Data Mining. Prentice-Hall. 2001.