MASTER OF COMPUTER APPLICATIONS
(SPECIALIZATION IN DATA SCIENCE)

Semester I

Advanced Data Structures and Algorithms using Python

1. Problem solving concepts
2. Abstract Data Types
3. Linear Data Structures
4. Binary Trees Binary Search Trees
5. AVL Trees
6. Tree Traversals
7. Hashing
8. Sorting Techniques
9. External Sorting
10. Topological Sort
11. Graph connectivity
12. Random walks on graph
13. adversary models
14. Randomized algorithm
15. a min-cut algorithm
16. Random Treap
17. Mulmuley games,
18. Markovs chains

Statistics for Computer Science

1. Bayes theorem
2. Discrete random variable
3. Continues random variable
4. Moment generating function
5. Joint distribution
6. Marginal and conditional distribution
7. Central limit theorem
8. Chebyshev's inequality
9. Large and small samples test
10. Mean and variance
11. Attributes and contingency table
12. Stochastic process
13. Time series
14. Auto regressive moving average models
15. Jenkins model
16. Classification
17. randomized design
18. randomized block design
19. Latin square design

Database Technology

1. DBMS Architecture
2. Data Modelling
3. Normalization
4. Structured Query Language
5. Query Processing
6. Query optimization
7. Storage and File organization
8. Object Oriented Databases
9. Transaction
10. Concurrency Recovery
11. Database Administration
12. ODBMS & ORDBMS
13. Distributed DATABASE
14. Parallel DBMS
15. Semi Structured
16. Unstructured Data Base

Object Oriented Programming using Java

1. Classes and Instances
2. Class Hierarchies
3. String handling
4. Packages
5. Interfaces
6. I/O STREAMS
7. Exception Handling
8. Multithreading
9. Networking
10. Client-Server Networking
11. Networking Interfaces and Classes
12. Working with Datagrams
13. Collection classes
14. Dictionary
15. Hash table

17. XML
18. XML and databases
16. Utility classes

Computer Networks

1. Categories of Networks
2. Communication model
3. Data transmission concepts
4. Protocol architecture
5. OSI
6. TCP/IP
7. Data link control
8. Error Detection and Error Correction
9. MAC
10. Ethernet
11. Bluetooth
12. Bridges
13. Network layer
14. Circuit switching
15. Packet switching
16. IPV6 and ICMP
17. Routing Protocols
18. Transport layer
19. Transport for Real Time Applications
20. APPLICATION LAYER

Semester II

Web Design and Development	Data Warehousing and Data Mining
1. HTML5 2. CASCADING STYLE SHEET 3. Embedding Style Sheets 4. Margins and Padding 5. JAVASCRIPT 6. Document Object Model 7. Event Handling 8. Controlling Windows & Frames 9. Media Management 10. Object-Oriented Techniques in JavaScript 11. JSON 12. jQuery 13. AJAX with jQuery 14. PHP 15. Angular JS 16. ZEND Framework 17. MySQL database	1. Functionalities 2. Integrate with Database 3. Data Preprocessing 4. DATA WAREHOUSING 5. OLAP Technology 6. Multidimensional Data Model 7. Data Warehouse Architecture 8. Data Generalization 9. Frequent Patterns 10. Associations and Correlations 11. Classification and Prediction 12. Classification Algorithms 13. Cluster Analysis 14. Clustering Methods 15. Outline analysis

MACHINE LEARNING	SOFTWARE ENGINEERING
1. Supervised learning 2. Linear Discriminants 3. Linear Regression 4. Multilayer perceptron 5. Back propagation 6. CLASSIFICATION ALGORITHMS 7. Classification of regression trees 8. Probability and Learning 9. k-Means algorithm 10. Vector Quantization 11. Principal component analysis 12. Simulated annealing 13. OPTIMIZATION TECHNIQUES 14. Markov Chain Monte Carlo methods	1. Process models 2. Prescriptive Process Models 3. Process Technology 4. Requirements Engineering 5. Developing use cases 6. Negotiating and validating requirements 7. UML Models 8. Class based modelling 9. Design Process 10. Software Architecture 11. Class Based Components 12. Web Apps 13. User Interface Design 14. TESTING STRATEGIES 15. Object Oriented Software Testing 16. AGILE METHODOLOGY 17. SPI Process 18. CMMI

Semester III

SOFTWARE TESTING AND QUALITY ASSURANCE	**DevOps**
1. Testing Axioms 2. Test Technique 3. Configuration Testing 4. Compatibility Testing 5. Foreign Language Testing 6. Usability Testing 7. Test Documentation Techniques 8. Test Planning 9. Test Case Tracking 10. Bug Tracking Systems 11. Common Project Level Metrics 12. AUTOMATION TESTING 13. Software Test Automation 14. QUALITY ASSURANCE 15. Capability Maturity Model 16. ISO 9000	1. Agile and DevOps 2. DevOps Tool 3. Workflow of DevOps 4. JIRA 5. VERSION CONTROL SYSTEMS 6. Version supporting tools 7. CONTINUOUS INTEGRATION 8. Jenkins 9. Maven 10. TeamCity 11. TESTING FRAMEWORKS 12. Automation Tools 13. JUnit5 Testing Framework 14. Behavior Driven Development-cucumber

Presentation skill and technical writing	
1. Listening skills 2. Cloze Exercises 3. Vocabulary building 4. Reading Skills 5. Voice, pace and gesture 6. Technical presentations 7. Strategies in GD 8. Mock GD 9. Body Language 10. Conversation Practice 11. Role Plays 12. Netiquette 13. Email etiquette 14. Mobile phone etiquette 15. Effective writing 16. Coherence 17. Project Writing	

SEMESTER IV

Personality Development	

1. Individual Uniqueness 2. Formal Theories 3. Personal Theories 4. Biological Measures 5. Behavioral Assessment 6. Projective Techniques 7. Self-Presentation 8. Social Comparison 9. Self-esteem 10. Self as a target of prejudice 11. Judging the social world 12. Behaviour and Attitudes 13. Self presentation 14. Self justification 15. Self perception 16. Time Management 17. Innovation and Creativity 18. Stress Management 19. Youth Development 20. Influence of Globalization	

ELECTIVES

ELECTIVE II

WEB ANALYTICS	**BIG DATA ANALYTICS**
1. Clickstream data 2. Web logs 3. Web beacons 4. Packet sniffing 5. DATA ANALYSIS 6. web analytic tool 7. Key Performance Indicators 8. Lab usability testing 9. Heuristic evaluations 10. URI 11. URL parameters 12. Geotagging 13. Google web analytics 14. On-page interacting tracking 15. Social Media Analytics 16. Triangulating mobiles	1. BD in Marking, Medical 2. Crowd sourcing analytics 3. Firewall analytics 4. NoSQL 5. Master-slave replication 6. Reduce calculations 7. Hadoop 8. Hadoop pipes 9. HDFS concepts 10. MapReduce 11. Map-reduce and YARN 12. Job scheduling 13. Hbase clients 14. Hive 15. HiveQL 16. HiveQL queries

ELECTIVE III

R PROGRAMMING	BIG DATA FRAMEWORK
1. R – ENVIRONMENT SETUP 2. R Command Prompt 3. Vectors 4. Lists 5. Operators 6. Decision Making 7. User Function 8. Data FRAMES 9. Factors 10. Tables 11. Control structures 12. Function 13. Function and Object	1. Four V's of big data 2. Distributed File System 3. Spark streaming 4. functions in scala 5. Try and Match Expressions 6. Control statements in scala 7. RDD transformations 8. Data partitioning in RDDs 9. Data File formats 10. Compression 11. Spark SQL 12. Accumulators 13. Fault tolerance

SEMANTIC WEB	DATA VISUALIZATION TECHNIQUES AND TOOLS
1. Design Decisions 2. Web Architecture 3. Web Technologies 4. Layered Approach 5. Distributing Web Resources 6. RDF Data Model 7. Direct Inference System 8. SPARQL 9. SPARQL Queries 10. Ontology Languages 11. OWL2 with RDF/RDFS 12. OWL2 Profiles 13. Monotonic Rules 14. Rule Interchange Format 15. Ontology Engineering	1. Data Visualization process 2. Spatial Data 3. Graphic Design 4. Graphical Integrity 5. Data Driven Document (DDD) 6. Analysis graphs 7. Statistical Graphs 8. Layouts 9. Geo Mapping 10. Color Processing 11. Zooming 12. Viewing 13. Multiform views

ELECTIVE IV

DATA CLASSIFICATION METHODS AND EVALUATION	PRINCIPLES DEEP LEARNING
1. Classification Techniques 2. Feature Selection 3. Filter Models 4. Algorithms for Streaming Features	1. Machine Learning 2. Linear Neuron 3. Forward Neural Networks 4. Delta Rule

5. Probabilistic Models 6. C4.5 7. CART 8. Incremental Decision Tree 9. Rule-Based Classification 10. Radial Basis Function Networks 11. Support Vector Machines 12. Neural Networks 13. Big Data Classification 14. Multimedia Classification 15. Time Series Data	5. Fast-Food Problem 6. Convolutional Neural Networks 7. TENSORFLOW 8. Memory Augmented Neural Networks 9. Differentiable Neural Computers 10. Temporal Linking 11. Deep Reinforcement Learning 12. Markov Decision Processes 13. Pole-Cart 14. Deep Learning in Health Care - Application