

Solapur University, Solapur
Computer Science & Engineering
(Faculty of Engineering & Technology)
Syllabus for Ph.D. Course Work

<i>Sr. No</i>	<i>Subject</i>	<i>Examination Scheme Theory paper</i>
1	Research Methodology & Information Communication Technology	100 Marks
2	Recent Trends in Computer Science & Engineering	100 Marks
3	Elective – Advanced Development in Computer Science & Engineering	100 Marks

Elective –

1. Advanced Development in Data Mining & Warehousing
2. Advanced Development in Distributed System
3. Advanced Cloud Computing

Note – 1. Candidate will select an elective in consultation with guide.

2. If required, guide may recommend an elective from-

a) Electronics Engineering

b) Electronics & Telecommunication Engineering

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Paper II – Recent Trends in Computer Science and Engineering

Examination Scheme: Theory paper 100 marks (3 hrs Duration)

Unit 1 : Machine Learning

Introduction, Concept Learning and the General-to-Specific Ordering, Decision Tree, Learning, Artificial Neural Networks, Evaluating Hypotheses, Bayesian Learning, Computational Learning Theory, Instance-Based Learning, Genetic Algorithms, Learning Sets of Rules, Analytical Learning, Combining Inductive and Analytical Learning, Reinforcement Learning

Unit 2 : Web Engineering

Introduction to Web Engineering, Requirements Engineering for Web Applications, Modelling Web Applications, Web Application Architecture, Technology-aware Web Application Design, Technologies for Web Application

Unit 3 : Cloud Computing

Introduction to Cloud Computing, Migrating into a Cloud, Enriching the 'Integration as a service' paradigm for the Cloud Era, The MapReduce Programming Model and Implementation

Unit 4 : Hadoop

Introduction to Hadoop, MapReduce, The Hadoop Distributed Filesystem, Hadoop I/O, HIVE, HBase, Pig.

Unit 5 : Big Data

Importance of Big Data, Industry examples of Big Data, Big Data Technology, Data Privacy and Ethics.

Unit 6 : Internet of Things :

Introduction, Approaching the Internet of Things, Defining the Internet of Things, Phases of the Internet of Things, First Phase, Early Research, Second Phase, Current Research, Technological Changes and Foundations, Foundations, The Internet in the Internet of Things, Breaking the Unbreakable: The End-to-End Principle, The Things in the Internet of Things

Reference Books :

Machine Learning by Tom M. Mitchell, McGraw Hill Publications

Web Engineering : Web Engineering by GertiKapel, Birgit Proil, Siegfied Reich, Warner Restschitzsegger, John Wiley & Sons, Ltd.

Cloud Computing : Cloud Computing - Principles and Paradigms by Rajkumar Buyya, James Broberg, Andrzej Goscinski, Willey India Pvt. Ltd., New Delhi

Hadoop : 1) The Definitive Guide, Tom White, IIIrd Edition, Shroff Publications & Distributors Pvt. Ltd.
2) Hadoop in Action, Cuck Lam, Dreamtech Press

Big Data :

Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses (Wiley CIO) Hardcover - 7 Mar 2013 by Michael Minelli, Michele Chambers, Ambiga Dhiraj.

Internet of things : <http://www.theinternetofthings.eu/sites/default/files/%5Buser-name%5D/The%20Internet%20of%20Things.pdf>

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PAPER – III : Elective: Advanced Development in Data Mining & Warehousing

Examination scheme: Theory paper: 100 marks (3 hrs duration)

Unit 1

Data Mining Tasks, Data Warehouse (Multidimensional Data Model, Data Warehouse Architecture, Implementation), Data Warehousing to Data Mining,

Unit 2

Data Preprocessing: Why Preprocessing, Cleaning, Integration, Transformation, Reduction, Discretization, Concept Hierarchy Generation, Descriptive Statistical Measures,

Unit 3

Classification: Decision Trees, Model Over fitting, Bayesian Classification, Rule-based classification, Nearest Neighbor Classifier, Classification by Back-propagation, Support vector machines, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy

Unit 4

Cluster Analysis: K-means, Agglomerative Hierarchical Clustering, DBSCAN

Unit 5

Association Rules: Apriori algorithm, FP-growth algorithm, Advanced techniques

Unit 6

Data Mining software and applications: Text mining (extracting attributes/keywords, structural approaches - parsing, soft parsing, Bayesian approach to classifying text), Web mining (classifying web pages, extracting knowledge from the web), Data Mining software and applications

Reference

1. J. Han and M. Kamber, "Data Mining- Concepts and Techniques", 2nd Edition, Morgan Kaufmann, 2006.
2. Margaret H. Dunham, "Data Mining Introductory and Advanced Topics", Prentice Hall
3. P. Tan, M. Steinbach and V., Kumar, "Introduction to Data Mining", Addison Wesley, 2006.

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PAPER III : Elective : Advanced Development in Distributed System

Examination scheme: Theory paper: 100 marks (3 hrs duration)

Unit 1: Fundamentals of distributed computing

Evolution, distributed computing system models, issues in designing DOS, introduction to distributed computing environment.

Unit 2: Message passing

Features, issues, synchronization, buffering, encoding and decoding, process addressing, failure handling.

Unit 3: Communication

Distributed shared memory: general architecture, design and implementation, structure of shared memory space, consistency models, RPC model: implementation, RPC messages, marshaling, unmarshaling, server management, communication protocols, RMI

Unit 4: Clock synchronization

Event ordering, mutual exclusion, deadlock, election algorithm

Unit 5: Process and Resource Management

Introduction, process migration, threads, task assignment approach, load balancing and load sharing approach.

Unit 6: Distribute File systems and security:

File models, file accessing models, file sharing semantics, file caching schemes, filereplication, fault tolerance, cryptography, authentication and access control

References:

1. Distributed operating systems, concepts and design
By P. K. Sinha, Prentice hall of India.
2. Distributed systems, principles and paradigms
By Andrew Tenenbaum, Maarten vanSteen .

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PAPER – III : Elective: Advanced Cloud Computing

Examination scheme: Theory paper: 100 marks (3 hrs duration)

UNIT-1

Cloud Computing : Overview, Applications, Intranet and the Cloud, First Movers on the cloud, the need for Cloud Computing, Benefits of cloud Computing, Limitations of the Cloud Computing, security concerns and regulatory issues, over view of different cloud computing applications which are implemented, Business case for implementing a Cloud

UNIT-II

Cloud Computing Technologies: Hardware and Infrastructure: Clients, Security, Network, services

Accessing the Clouds: Platforms, WEB applications, WEB APIS, WB Browsers

Cloud Storage: Overview, Storage provides, **Cloud Standards:** Applications, Client, Infrastructure, Services

UNIT-III

Cloud Computing Mechanisms: Software as a service: Overview, Driving Forces, Company offerings, Industries, Software + services: Overview, Mobile Device Integration, Providers, Microsoft Online

Application development: Google, Microsoft, Intuit Quick base, Cast Iron Cloud, Bungee Connect

Development Platforms: Google, Sales Force, Azure, Trouble shooting, Application management

UNIT-IV

Local Clouds: Virtualization, server solutions, Thin Clients

Migrating to the clouds: Cloud services for individuals, Mid-market, and Enterprise wide, Migration, best practices, analyzing the service

UNIT V

Using Cloud Services: Collaborating on Calendars, Schedules, and Task Management, Collaborating on Event management, Collaborating on Contact management, collaborating on Project Management, Collaborating on Word Processing, Collaborating on Spread sheets, Collaborating on Databases, Collaborating on presentations, Storing and sharing Files and other online content, sharing Digital Photographs, controlling the collaborations with Web-Based Desktops

Online Collaborations: Collaborating Via WEB based communication Tools, Collaborating Via Social Networks and Groupware, collaborating Via Blogs and Wikis.

Book :

1. Cloud Computing a practical approach, Anthony T Velte, Toby J Velte, Robert Elsenpeter, Tata McGraw-HILL,2010 Edition
2. Cloud Computing-web Based application that change the way you work and collaborate online, Michael Miller, Pearson Education,2009 Edition
3. “Cloud Computing for Dummies” by Judith Hurwitz , Bloor Robin, Marcia Kaufman & Fern Halper, November 2009.