

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
DEVI AHILYA UNIVERSITY, INDORE**

M. Tech. (IT) 5½ Years

IX SEMESTER



Jul. 2017 – Dec. 2017

Sub. Code	Sub. Name	Credit
IT-919	Advance Database Management System	4
IT-913	Optimization Techniques	4
IT-908A	Object Oriented Analysis and Design	4
IT-918	Cloud Computing	4
IT-919A	ADBMS Lab	2
IT-911B	Project	4
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IT-919: Advanced Database Management System

Aim of Course: To learn advanced features of DBMS and build capacity to implement and maintain an efficient database system using emerging trends.

Objectives:

The course is designed to make students:

- Be able to master the concepts and design with proficiency databases under the relational model.
- Proficiency in the choice of DBMS platform to use for specific requirements
- Be proficient with a broad range of data management issues including data integrity and security, transaction processing and others.
- Be familiar with the fundamentals of distributed DBMS and object database management, data warehousing and data mining

Course Contents:

UNIT I

Introduction with DBMS and ER Model : Advantage of DBMS approach, various view of data, data independence, schema and sub-schema, primary concepts of data models, Database languages, transaction management, Storage management Database administrator and users, overall system architecture.

Basic concepts of ER model, design issues, mapping constraint, keys, ER diagram, weak and strong entity sets, specialization and generalization, aggregation, inheritance, design of ER schema.

UNIT II

Functional Dependencies and Normalization: Domains, relations, keys, super key, candidate, primary, alternate and foreign keys, Functional dependence, Full Functional dependence, trivial dependencies, transitive dependencies, Mutual independence, closure set of dependencies, non loss decomposition, FD diagram. Introduction to normalization, first, second, third Normal forms, dependency preservation, BCNF, Multivalued dependencies and fourth normal form.

UNIT III

PL/SQL fundamentals: Variables, reserve words, identifiers, anchored data types, blocks, labels, use of DML in PL/SQL, commits, rollback, savepoint, conditional control: if, case, nullif, coalesce, iterative processing with loops: Loop basics , simple loops, while, for loop.

UNIT IV

Database Integrity, Transaction, concurrency and Recovery: Basic idea of Database Integrity, Integrity rules, assertions, integrity Constraints, triggers.

Basic concepts of Transaction, ACID properties, Transaction states, implementation of atomicity and durability, concurrent executions, Serializability, Conflict serializability, View serializability, basic idea of concurrency control, Concept of locking, types of locks, basic idea of deadlock, deadlock handling.

UNIT V

Distributed Database and Emerging Fields in DBMS: Basic idea of Distributed database, distributed data storage, data replication, data fragmentation- horizontal vertical and mixed fragmentation.

Object oriented Databases-basic idea and the model, object structure, object class, inheritance, multiple inheritance, object identity.

Data warehousing- terminology, definitions, characteristics, data mining and it's overview, Database on www, multimedia Databases- introduction, similarity based retrieval, continuous

media data, multimedia data formats, video servers.

Reference Books:

1. A Silberschatz, H.F Korth, Sudersan “Database System Concepts” , MGH Publication.
2. Modern Database Management (5th Edition) (Hardcover) by Fred R. McFadden, Jeffrey A. Hoffer, Mary B. Prescott
3. Elmasri & Navathe “Fundamentals of Database systems” – III ed.
4. B.C. Desai. “An introduction to Database systems” BPB.

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IC-913: Optimization Techniques

Aim of Course: The principle aim of this course is to make the students aware of organizational behavior of management-process and importance of decision-making in real life situations.

Objectives:

The course is designed to make students:

- Understand different techniques of optimization, which help in analyzing the process of decision-making.
- To learn problem formulation of optimization.
- To realize the methods of optimization.
- To know the applications of optimization.
- Understand basic concepts of Linear programming and Dynamic Programming

Course Contents:

UNIT I

Organizational behavior and management. Introduction to O.R. Techniques. Models: - Meaning and classifications.

UNIT II

Linear Programming Problems (L.P.P.), Graphical solutions, Simplex algorithm, Principle of Duality, post optimality analysis. Transportation problem, Initial basic feasible solutions, MODI'S optimality analysis, Degeneracy.

UNIT III

Assignment Problem, traveling Salesmen problem, Branch and Berend techniques. Integer program: - Necessity of Integer programming, use of Branch and Berend Technology for solving Integer Programming problem.

UNIT IV

Queue-theory: - Importance of waiting-line in networking Q-models. Dynamic programming problems.

UNIT V

Theory of Games: - Introduction, pay-off matrix, Minimum-Maximum principle, Saddle-point principle of Dominance. Introduction to Inventory Analysis

Reference Books:

1. Dr. S.D. Sharma, Text Book of Operations Research.
2. N.D. Vora, Quantitative Techniques in management.
3. Kanti Swarup, P.K. Gupta and M.M. Singh , Operations Research..
4. H.A. Taha, Introduction to Operations Research.

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IT-908A: Object Oriented Analysis and Design

Aim of Course: To enable the students to have a thorough understanding of the activities associated to develop projects. And establish the flow of events by making a planning that how software can be shown in its entirety prior to its implementation using Object Oriented Analysis and Design techniques.

Objectives:

The course is designed to make students:

- Develop a working understanding of formal object-oriented analysis and design processes.
- Develop the skills to determine which processes and OOAD techniques should be applied to a given project.
- Develop an understanding of the application of OOAD practices from a software project management perspective

Course Contents:

UNIT I

Object oriented analysis and its design. Software engineering best practices. UML: its road map. Root causes of software failure and symptoms of software failure.

UNIT II

Introduction to the Rational Unified process: Workflow and Lifecycle. Introduction to Object Orientations: problem definition, modeling, using UML modeling mechanisms and their representation.

UNIT III

Requirements Management: key concepts, problem statement, Glossary, use- case model, supplementary specification, functional and nonfunctional requirements.

UNIT IV

Analysis and design overview: architectural analysis-layers. Use case Analysis- Responsibilities, attributes and association, Architectural design.

UNIT V

Describe concurrency, Describe distribution, Use- case design, Subsystem Design, Class design, package.

Reference Books:

1. P.Kruchen, The Rational Unified Process: An Introduction, Pearson Education Asia, 2000.
2. G. Booch, I. Jacobson, J. Rumbaugh, The Unified Modeling Language- User's Guide, Addison Wesley, 1999.
3. W. Boggs and M. Boggs, Mastering UML with Rational Rose, BPB Publications, 1999.
4. G. Booch, Object oriented Analysis and Design with Applications, Addison Wesley, 1994.
5. M. Blaha, J. Rumbaugh, Object oriented modeling and design with UML, Pearson education 2nd edition, 2007.

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IT-918: Cloud Computing

Aim of Course: To enable the students to have a thorough understanding of the activities associated to Cloud computing, its architecture, virtualization technology etc.

Course Contents:

Unit-I

Introduction: Historical development ,Vision of Cloud Computing, Characteristics of cloud computing as per NIST , Cloud computing reference model ,Cloud computing environments, Cloud services requirements, Cloud and dynamic infrastructure, Cloud Adoption and rudiments .Overview of cloud applications: ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis ,Satellite Image Processing ,CRM and ERP ,Social networking .

Unit-II

Cloud Computing Architecture: Cloud Reference Model, Types of Clouds, Cloud Interoperability & Standards, Scalability and Fault Tolerance, Cloud Solutions: Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management. Cloud Offerings: Cloud Analytics, Testing Under Control, Virtual Desktop Infrastructure.

Unit –III

Cloud Management & Virtualization Technology: Resiliency, Provisioning, Asset management, Concepts of Map reduce , Cloud Governance, High Availability and Disaster Recovery. Virtualization: Fundamental concepts of compute ,storage, networking, desktop and application virtualization .Virtualization benefits, server virtualization, Block and file level storage virtualization Hypervisor management software, Infrastructure Requirements , Virtual LAN(VLAN) and Virtual SAN(VSAN) and their benefits .

Unit-IV

Cloud Security: Cloud Information security fundamentals, Cloud security services, Design principles, Secure Cloud Software Requirements, Policy Implementation, Cloud Computing Security Challenges, Virtualization security Management, Cloud Computing Security Architecture .

Unit-V

Market Based Management of Clouds , Federated Clouds/Inter Cloud: Characterization & Definition , Cloud Federation Stack , Third Party Cloud Services .

Case study : Google App Engine

Recommended Text:

1. Buyya, Selvi ,” Mastering Cloud Computing “,TMH Pub
2. Kumar Saurabh, “Cloud Computing” , Wiley Pub
3. Krutz , Vines, “Cloud Security “ , Wiley Pub
4. Velte, “Cloud Computing- A Practical Approach” ,TMH Pub
5. Sosinsky, “ Cloud Computing” , Wiley Pub