

classification, various model comparison criteria. Ensemble Modeling: combining predictive models to create even more powerful models; includes boosting and bagging strategies.		
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Text book and Reference books:

1. Data Mining for Business Intelligence: Concepts, Techniques and Applications with JMP Pro; Shmueli, Bruce, Stephens, Patel 2017, Wiley & Sons
2. Preparing Data for Analysis with JMP by Robert Carver
3. Introduction to Statistical Learning, sixth printing, by Gareth, Tibshirani, Hastie, and Whitten

Database Management Systems**Code: OECAIML-601A****Contact: 3L**

Name of the Course:	Database Management Systems		
Course Code: OECAIML-601A	Semester: VI		
Duration:6 months	Maximum Marks:100		
Teaching Scheme		Examination Scheme	
Theory:3 hrs./week		Mid Semester exam: 15	
Tutorial: NIL		Assignment and Quiz: 10 marks	
		Attendance: 5 marks	
Practical: hrs./week		End Semester Exam:70 Marks	
Credit Points:	3		

Unit	Content	Hrs/Unit	Marks/Unit
1	Database system architecture: Data Abstraction, Data Independence,Data Definition Language(DDL),Data ManipulationLanguage(DML). Data models: Entity-relationshipmodel, network model, relational and object oriented data models, integrity constraints, data manipulation operations.	9	

2	Relational query languages: Relational algebra, Tuple and domain relational calculus, SQL3, DDL and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQLserver. Relational database design: Domain and data dependency, Armstrong's axioms, Normal forms, Dependency preservation, Lossless design. Query processing and optimization: Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms.	13	
3	Storage strategies: Indices, B-trees, hashing.	3	
4.	Transaction processing: Concurrency control, ACID property, Serializability of scheduling, Locking and timestamp based schedulers, Multi-version and optimistic Concurrency Control schemes, Database recovery.	5	
5	Database Security: Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection.	3	
6	Advanced topics: Object oriented and object relational databases, Logical databases, Web databases, Distributed databases, Data warehousing and data mining.	3	

Text book and Reference books:

1. "Database System Concepts", 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill.
2. "Principles of Database and Knowledge – Base Systems", Vol 1 by J. D. Ullman, Computer Science Press.
3. Database Management Systems, R.P. Mahapatra, Khanna Publishing House, New Delhi (AICTE Recommended Textbook – 2018)
4. "Fundamentals of Database Systems", 5th Edition by R. Elmasri and S. Navathe,
5. Pearson Education "Foundations of Databases", Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, Addison-Wesley