



இந்திய தகவல் தொழில்நுட்பக் கழகம், திருச்சிராப்பள்ளி
भारतीय सूचना प्रौद्योगिकी संस्थान, तिरुचिरापल्ली
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Amendments to M.Tech. (CSE) 2021 Curriculum
(Ref: Minutes of 21st senate meeting, 22 December, 2023)

As per the clause S21.11 (21/SENATE/2023/RESOLUTION/11) in the minutes of 21st senate meeting held on 22nd December 2023, the following amendment for M.Tech. (CSE) has been approved.

21/SENATE/2023/RESOLUTION/11

To consider second semester core course – Internet of Things (CS5152) and IoT Laboratory (CS5156) to be replaced with Advanced Databases Theory and Laboratory in M.Tech CSE 2021 curriculum

Course Code	:	CS5152
Course Title	:	Advanced Databases
Number of Credits	:	3-0-0-3
Prerequisites (Course code)	:	None
Course Type	:	Core

Course outcomes: At the end of the course, the student will be able to:

CO1	Write complex queries including full outer joins, self-join, sub queries, and set theoretic queries.
CO2	Know about the lock based concurrency control techniques
CO3	Know about the timestamp based concurrency control techniques
CO4	Implement query optimization techniques
CO5	Work with Main –memory Databases and Data Streams

Course Content:

Introduction Evaluation of relational algebra expressions, query equivalence, join strategies, query optimization algorithms, Formal review of relational database and FDs Implication, Closure, its correctness.

Locking and Concurrency Control Correctness of interleaved execution, Locking and management of locks, Two Phase Locking, deadlocks, multiple level granularity, Concurrency Control on B+ trees, Optimistic Concurrency Control

Timestamp Based Techniques Timestamp based techniques, Multiversion approaches, Comparison of Concurrency Control methods, dynamic databases, Failure classification, recovery algorithm, XML and relational databases

Query Optimization Query Optimization, Rule-Based Query Optimization using the Volcano Framework, Adaptive Query processing

Databases Main-Memory Databases, Parallel and Distributed Databases, Massively Parallel Data Management Systems, Streaming Data and Reactive Applications

Text Books:

1. R. Elmasri and S. B. Navathe, “Fundamentals of Database Systems”, Seventh Edition, Pearson Education / Addison Wesley, 2016.
2. R. Ramakrishnan, J. Gehrke, Database Management Systems, McGraw Hill, 2004.
3. Silberschatz, Henry F. Korth, and S. Sudharshan, “Database System Concepts”, 6th Ed., McGraw Hill, 2010.

Course Code	:	CS5156
Course Title	:	Advanced Databases laboratory
Number of Credits	:	0-0-3-2
Prerequisites (Course code)	:	CS5152
Course Type	:	ELR

Course outcomes: At the end of the course, the student will be able to:

CO1	Comprehend the internal working of a database system
CO2	Design database and apply normalization techniques
CO3	Design and develop a database using SQL and the mechanism in connecting with a Web based GUI
CO4	Implement indexing techniques on the database.
CO5	Apply Machine learning algorithms to the real time datasets using Python/R programming languages

Course Content:

1. Working with Basic SQL
2. Working with Intermediate SQL.
3. Advanced SQL using procedures, functions and Triggers.
4. Database Design and Normalization techniques.
5. Working with XML
6. Accessing Databases from Programs using JDBC
7. Working with PHP and MySQL
8. Indexing and Query Processing
9. Query Evaluation Plans
10. Working with classification algorithms using Python / R programming
11. Working with clustering techniques using Python / R programming
12. Database Design and implementation (Mini Project)