NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	**M. Tech**		
Course Title	Advanced Databases		
Course Code	CS604	**No. of Credits**	3
Course Code of Pre-requisite subject(s)		**Semester**	III
Session	JAN/2023	**Section (if, applicable)**	
Name of Faculty	Dr. Chandramani Chaudhary	**Department**	CSE
Official Email	chandramani@nitt.edu	**Telephone No.**	NIL
Name of Course Coordinator(s) (if, applicable**)**	NIL		
Official E-mail	NIL	**Telephone No.**	NIL
Course Type (please tick appropriately**)**	Elective course		

Syllabus (approved in BoS)

Unit I Introduction
Evaluation of relational algebra expressions, query equivalence, join strategies, query optimization algorithms, Formal review of relational database and FDs Implication, Closure, its correctness
Unit II 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
Unit III Timestamp Based Techniques
Timestamp based techniques, Multiversion approaches, Comparison of Concurrency Control methods, dynamic databases, Failure classification, recovery algorithm, XML and relational databases
Unit IV Query Optimization
Query Optimization, Rule-Based Query Optimization using the Volcano Framework, Adaptive Query processing
Unit V 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. A. Silberschatz, Henry F. Korth, and S. Sudharshan, "Database System Concepts", 6th Ed., McGraw Hill,

2010.	

COURSE OBJECTIVES

- To understand the basic concepts and terminology related to DBMS and Relational Database Design
- To the design and implement Distributed Databases.
- To understand advanced DBMS techniques like parallel and Main- memory databases
- To understand the concept of transaction management in the database

MAPPING OF COs with POs

Course Outcomes	Programme Outcomes (PO) (Enter Numbers only)
1. Write complex queries including full outer joins, self-join, sub queries, and set theoretic queries.	
2. Know about the file organization, Query Optimization	
3. Know about the Transaction management, and database administration techniques	
4. Work with Main –memory Databases and Data Streams	

COURSE PLAN – PART II

COURSE OVERVIEW

In this course, students will learn about the design and implementation of web pages with Python, JavaScript, and SQL using frameworks like Django.

COURSE TEACHING AND LEARNING ACTIVITIES			(Add more rows)
S.No.	**Week/Contact Hours**	**Topic**	**Mode of Delivery**
1	18/10/2023 to 20/10/2023 2 hours	**Unit I Introduction** Evaluation of relational algebra expressions**,** query equivalence,	Chalk and Talk with PPT Presentation
2	23/0/2023 to 27/0/2023 3 hours	join strategies, query optimization algorithms, Formal review of relational database and FDs Implication	Chalk and Talk with PPT Presentation
3	30/01/2023 to 3/02/2023 3 hours	Closure, its correctness. **Unit II Locking and Concurrency Control** Correctness of interleaved execution	Chalk and Talk with PPT Presentation
4	6/02/2023 to 10/02/2023 3 hours	Locking and management of locks, Two Phase Locking, deadlocks,	Chalk and Talk with PPT Presentation
5	13/02/2023 to 17/02/2023 3 hours	Multiple level granularity, Concurrency Control on B+ trees	Chalk and Talk with PPT Presentation

6	20/02/2023 1 hour	Optimistic Concurrency Control	Chalk and Talk with PPT Presentation
7	21/02/2023 to 24/02/2023 1 hour	Cycle Test -1	
8	27/02/2023 to 3/03/2023 3 hours	**Unit III Timestamp Based Techniques** Timestamp based techniques, Multiversion approaches	Chalk and Talk with PPT Presentation
9	6/03/2023 to 10/03/2023 3 hours	Comparison of Concurrency Control methods, dynamic databases	Chalk and Talk with PPT Presentation
10	13/03/2023 to 17/03/2023 3 hours	Failure classification, recovery algorithm, XML and relational databases	Chalk and Talk with PPT Presentation
11	20/03/2023 1hour	**Unit IV Query Optimization** Query Optimization	Chalk and Talk with PPT Presentation
12	21/03/2023 to 24/0/2023 1 hour	Cycle Test -2	
13	27/03/2023 to 31/03/2023 3 hours	Rule-Based Query Optimization using the Volcano Framework	Chalk and Talk with PPT Presentation
14	3/04/2023 to 6/04/2023 2 hours	Adaptive Query processing	Chalk and Talk with PPT Presentation
15	10/04/2023 to 13/04/2023 3 hours	**Unit V Databases** Main-Memory Databases, Parallel and Distributed Databases	Chalk and Talk with PPT Presentation
16	17/04/2023 to 21/04/2023 3 hours	Massively Parallel Data Management Systems, Streaming Data and Reactive Applications	Chalk and Talk with PPT Presentation

COURSE ASSESSMENT METHODS (shall range from 4 to 6**)**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test 1	21/02/2023 to 24/02/2023	1 hour	20
2	Cycle Test 2	21/03/2023 to 24/0/2023	1 hour	20

3	Reading Assignments	13/02/2023 to 15/04/2023	3 hours	10
4	Project	13/02/2023 to 15/04/2023	3 hours	20
CPA	Compensation Assessment*	As per academic schedule	1 hour	15
5	Final Assessment *	As per academic schedule	3 hours	30

*mandatory; refer to guidelines on page 4

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

1. Students' feedback through PAC meetings
2. Feedbacks are collected before final examination through MIS or any other standard format followed by the institute
3. Students, through their Class Representatives, may give their feedback at any time to the course faculty which will be duly addressed.

COURSE POLICY (including compensation assessment to be specified**)**

MODE OF CORRESPONDENCE (email/ phone etc)
Email and Phone

COMPENSATION ASSESSMENT POLICY
1. One compensation assessment will be given after completion of Cycle Test 1 and 2 for the students those who are absent for any assessment due to genuine reason.
2. Compensatory assessments would cover the syllabus of Cycle tests 1 & 2
3. The prior permission and required documents must be submitted for absence signed by HoD/CSE.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

➢ At least 75% attendance in each course is mandatory.

➢ A maximum of 10% shall be allowed under On Duty (OD) category.

➢ Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

➢ Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.

➢ Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.

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- ➢ The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

- ➢ The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

1. The Course Coordinator is available for consultation during the time intimated to the students
2. Relative grading adhering to the instructions from the office of the dean (Academic) will be adopted for the course.

FOR APPROVAL

Course Faculty   **CC- Chairperson**   **HOD**

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Guidelines

a) The number of assessments for any theory course shall range from 4 to 6.

b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.

c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.

d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	**2017**	**2016**	**2015**	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.

f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.

g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.