NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF COMPUTER APPLICATIONS

COURSE PLAN – PART I			
Name of the programme and specialization	**MCA**		
Course Title	**Database Systems**		
Course Code	**CA712**	**No. of Credits**	**3**
Course Code of Pre-requisite subject(s)	**CA711, CA713**		
Session	**January 2022**	**Section (if, applicable)**	**A**
Name of Faculty	**Dr.R.Balaji Ganesh**	**Department**	**Computer Applications**
Official Email	**rbalaji@nitt.edu**	**Mobile No.**	**82200 37222**
Name of Course Coordinator(s) (if, applicable)	**Dr. (Mrs.) B.Janet**		
Official E-mail	**janet@nitt.edu**	**Telephone No.**	**94426 48096**
Course Type (please tick appropriately)	☑ **Core course**	☐ **Elective course**	

Syllabus (approved in BoS)

File System versus DBMS – Advantages – Database Languages – ER-Modelc: Entities Relationships – Additional Features of ER Model – Conceptual Design with ER Model.

Relational Model – Keys - Constraints – Querying – Views - Relational Algebra – Relational Calculus – SQL – QBE.

File Organization – Organization of records in files – Indexing – Ordered Indices - B + Tree Index files – Hashing – Static – Dynamic – Query Optimization – Transformation of Relational Expressions – Choice of evaluation plans.

Database Design – Pitfalls in Relational Database Design – Functional Dependencies – Decomposition – Normalization – I to V Normal Forms.

DB Tuning – Security – Transaction Management – Transactions – Transaction state – Concurrent executions – Serializability – Concurrency Control – Protocols – Crash Recovery.

References:

1. Raghu Ramakrishnan and Johannes Gehrke, "Data Base Management Systems", 3rd Edition, McGraw-Hill, 2003.

2. Silberschatz, Korth and Sudarshan, "Data Base System Concepts", McGraw-Hill, 6th Edition, 2010.
3. C. J. Date, "An Introduction to Database Systems", 8th Edition, Addison-Wesley, 2003.
4. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", 6th Edition, Pearson Education/Addison Wesley, 2011.

COURSE OBJECTIVES

- *To learn different database models and design of databases and to study query languages and transaction management*

MAPPING OF COs with POs

Course Outcomes	Programme Outcomes (PO)
1. Illustrate the features of DBMS & Models for designing databases	**PO1, PO2, PO3**
2. Describe the nuances of Data retrieval methods	**PO3,PO4,**
3. Apply normalization techniques in DB design	**PO3, PO5**
4. Perform concurrency and Transaction Management operations	**PO4,PO5, PO6**

COURSE PLAN – PART II

COURSE OVERVIEW

Students will get exposure to the need and features of Database Systems. Learners will be able to conceptualize a model for a database systems using ER diagrams. Learners will be acquainted with the relational schema for a database system. This course will also facilitate the learner to have an in-depth insights into SQL including database decomposition methods. Learnerse will get information on the various DB tuning and management activities.

COURSE TEACHING AND LEARNING ACTIVITIES (Add more rows)

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week 1 (4 Hours)	File System versus DBMS – Advantages – Database Languages, ER-Models: Entities Relationships	MS Teams / PPT
2	Week 2 (4 Hours)	– Additional Features of ER Model. Conceptual Design with ER Model. Case Studies and problems in ER diagrams	MS Teams / PPT
3	Week 3 (4 Hours)	Relational Model – Keys - Constraints – Querying	MS Teams / PPT
4	Week 4 (4 Hours)	Views - Relational Algebra – Relational Calculus, SQL – QBE	MS Teams / PPT

5	Week 5 (4 Hours)	File Organization – Organization of records in files – Indexing – Ordered Indices - B + Tree Index files	MS Teams / PPT
6	Week 6 (4 Hours)	Hashing – Static – Dynamic – Query Optimization –	MS Teams / PPT
7	Week 7 (4 Hours)	Transformation of Relational Expressions, Choice of evaluation plans.	MS Teams / PPT
8	Week 8 (4 Hours)	Database Design – Pitfalls in Relational Database Design, Functional Dependencies	MS Teams / PPT
9	Week 9 (4 Hours)	Decomposition – Normalization – I to V Normal Forms.	MS Teams / PPT
10	Week 10 (4 Hours)	DB Tuning – Security – Transaction Management – Transactions	MS Teams / PPT
11	Week 11 (4 Hours)	Transaction state – Concurrent executions – Serializability – Concurrency Control – Protocols – Crash Recovery	MS Teams / PPT

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S. No.	Mode of Assessment	Week/ Date	Duration	Platform	% Weightage
1	Cycle Test-I	Week 5	1 Hour	Instructure Canvas	**20**
2	Assignment-I	Week 6	-	Google Forms	**10**
3	Cycle Test-II	Week 8	1 Hour	Instructure Canvas	**20**
4	Assignment-II	Week 9	-	Google Forms	**10**
5	Seminar	Week 10	-	MS Teams	**10**
CPA*	Compensation Assessment*	Week 11	1 Hour	Instructure Canvas	20
6	End Semester Exam	July First week	2 Hours	Instructure Canvas	**30**

***mandatory; refer to guidelines on page 4**

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

Students are advised to submit oral and written feedback whenever required as self or through Class representative. The students will be asked to submit feedback through NITT MIS and appropriate mechanism will be carried out to make this course more learner centric.

Students can meet the course instructor at any time (with prior appointment) in the course duration, to give feedback about difficulty in understanding the concept. Students are advised to give genuine feedback about the course contents, delivery etc.

COURSE POLICY (including compensation assessment to be specified)

Students will be advised to contact the course instructor through email whenever required for clarification in the assessment pattern, course contents, learning materials.

Students who have missed the Cycle Test I due to genuine reason, can appear for the Compensation assessment, with prior permission of the course instructor.

The CPA will be conducted before the start of End Semester Assessment.

Students are strictly not allowed to enroll for compensation assessment for improvement of marks scored.

Students should submit assignment before the completion of the due dates. Late submissions will not be considered on any grounds.

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.
- 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

Online resources from the author of the Reference Book 1 (listed above) is available at http://pages.cs.wisc.edu/~dbbook/openAccess/thirdEdition/

Interested Students can also enroll for MOOCs. Below is the list of popular MOOC offered by different entities;

1. Introduction to Database Systems, IIT Madras, NPTEL, Aril 2021 (https://onlinecourses.nptel.ac.in/noc21_cs52/preview)
2. Database Management Essentials, University of Colorado, Coursera (https://www.coursera.org/learn/database-management)
3. Database Systems, SQL Tutorial available at https://livesql.oracle.com/

FOR APPROVAL

Course Faculty **CC- Chairperson** 5/12/22 **HOD**

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.