4TH SEMESTER BSc. ITM(H)			
	SUB CODE		SUB NAME
MAJOR	CORE-I	PAPER-8	Database Systems
	CORE-I	PAPER-9	Organizational Behaviour
	CORE-I	PAPER-10	Foundation of Data Science & Data Analytics
MINOR	CORE-III	PAPER-2	Mechanics
	INTERNSHIP		

Semester-IV

Core VIII **Database Systems**

Course Objectives:

To explain basic database concepts, applications, data models, schemas and instances. To demonstrate the use of constraints and relational algebra operations. Describe the basics of SQLand construct queries using SQL. To emphasize the importance of normalization in databases. To facilitate students in Database design. To familiarize issues of concurrency control and transaction management.

Course Outcomes: **On completion of this course, students will be able to**

- Apply the basic concepts of Database Systems and Applications.
- Use the basics of SQL and construct queries using SQL in database creation and interaction.
- Design a commercial relational database system (Oracle, MySQL) by writing SQL usingthe system.
- Analyze and Select storage and recovery techniques of database system

Unit-I:

Introduction to Database and Database Users, Database System Concepts and Architecture: dataModels, schema, and instances, Conceptual Modeling and Database Design: Entity Relationship(ER) Model: Entity Types, Entity Sets, Attributes, Keys, Relationship Types, Relationship Sets, Roles and Structural Constraints, Weak Entity Types, ER Naming Conventions. Enhanced Entity- Relationship (EER) Model.
Outcome: Students will understand the database, its types, uses and applications. They will able to understand various data models.

Unit-II:
Database Design Theory and Normalization: Functional Dependencies, Join Dependencies, Normal Forms based on Primary Keys, Second and third Normal Forms,

Boyce-Codd Normal Form, Multi valued Dependency and Fourth Normal Form.
Outcome: Students will understand details of database design and will be able to design the real time data using various normal forms.

Unit-III:

Relational data Model and SQL: Relational Model Concepts, Basic SQLs, SQL Data Definition and Data types, Constraints in SQL, Retrieval Queries in SQL, INSERT, DELETE, UPDATE Statements in SQL, Relational Algebra and Relational Calculus: Unary Relational Operations: SELECT and PROJECT, Binary Relation: JOIN and DIVISION.
Outcome: Students will able to access and manipulate the data using SQL.

Unit-IV:

Introduction to Transaction Processing Concepts and Theory: Introduction to Transaction Processing, Properties of Transactions, Recoverability, Serializability, Concurrency Control: locking techniques and Time-Stamp Ordering.
Outcome: Students will learn about transaction processing in real world, how to handle data when more than one user accessing the same database using various methods.

Text Books:

- ✓ *Fundamentals of Database Systems, 6th edition, Ramez Elmasri, Shamkant B. Navathe,Pearson Education.*

Reference Books:

- ✓ An Introduction to Database System, Date C.J.- Pearson Education, New Delhi-2005.

Database Systems

Create and use the following database schemas to answer the given queries.

EMPLOYEE Schema			
Field	**Type**	**NULLKEY**	**DEFAULT**
Eno	Char (3)	NO	PRI
Ename	Varchar (50)	NO	
Job_type	Varchar (50)	NO	

Manager	Char (3)	Yes	FK
Hire_date	Date	NO	
Dno	Integer	YES	FK
Commission	Decimal (10,2)	YES	
Salary	Decimal (7,2)	NO	
DEPARTMENT Schema			
Field	**Type**	**NULLKEY**	
Dno	Integer	No	PRI
Dname	Varchar (50)	Yes	
Location	Varchar (50)	Yes	

Query List:

- Query to display Employee Name, Job, Hire Date, Employee Number; for each employee with the Employee Number appearing first.
- Query to display unique Jobs from the Employee Table.
- Query to display the Employee Name concatenated by a Job separated by a comma.
- Query to display all the data from the Employee Table. Separate each Column by acomma and name the said column as THE_OUTPUT.
- Query to display the Employee Name and Salary of all the employees earning more than
- $2850.
- Query to display Employee Name and Department Number for the Employee No=7900.
- Query to display Employee Name and Salary for all employees whose salary is not in therange of $1500 and $2850.
- Query to display Employee Name and Department No. of all the employees in Dept10 and Dept 30 in the alphabetical order by name.
- Query to display Name and Hire Date of every Employee who was hired in 1981.
- Query to display Name and Job of all employees who don't have a current Manager.
- Query to display the Name, Salary and Commission for all the employees who earncommission.
- Sort the data in descending order of Salary and Commission.
- Query to display Name of all the employees where the third letter of their name is 'A'.

- Query to display Name of all employees either have two ‘R’s or have two ‘A’s in theirname and are either in Dept No=30 or their Mangers Employee No= 7788.
- Query to display Name, Salary and Commission for all employees whose CommissionAmount is 14 greater than their Salary increased by 5%.
- Query to display the Current Date.
- Query to display Name, Hire Date and Salary Review Date which is the 1st Monday aftersix months of employment.
- Query to display Name and calculate the number of months between today and the dateeach employee was hired.
- Query to display the following for each employee <E-Name> earns <Salary> monthlybut wants <3* Current Salary>. Label the Column as Dream Salary.
- Query to display Name with the 1stletter capitalized and all other letter lower case andlength of their name of all the employees whose name starts with ‘J’, ‘A’ and ‘M’.
- Query to display Name, Hire Date and Day of the week on which the employee started.
- Query to display Name, Department Name and Department No for all the employees.
- Query to display Unique Listing of all Jobs that are in Department #30.
- Query to display Name, Department Name of all employees who have an ‘A’ in theirname.
- Query to display Name, Job, Department No. and Department Name for all the employees working at the Dallas location.
- Query to display Name and Employee no. Along with their Manger’s Name and the Manager’s employee no; along with the Employees Name who do not have a Manager.
- Query to display Name, Department No. And Salary of any employee whose department No. and salary matches both the department no. And the salary of any employee who earns a commission.
- Query to display Name and Salaries represented by asterisks, where each asterisk (*) signifies $100.
- Query to display the Highest, Lowest, Sum and Average Salaries of all the employees.
- Query to display the number of employees performing the same Job type functions.
- Query to display the no. of managers without listing their names.
- Query to display the Department Name, Location Name, No. of Employees and the average salary for all employees in that department.
- Query to display Name and Hire Date for all employees in the same dept. as Blake.
- Query to display the Employee No. And Name for all employees who earn more than the average salary.
- Query to display Employee Number and Name for all employees who work in a department with any employee whose name contains a ‘T’.
- Query to display the names and salaries of all employees who report to King.
- Query to display the department no, name and job for all employees in the Salesdepartment.

Core IX **Organizational Behaviour**

Course Objectives:

The objective of this course is to learn the modern trends, theories and changes in organizational behaviour. This course covers the explanations about the human behavior in the organizational context. It details the impact of individual, group and organizational factors on human behavior. The course also focuses on understanding the behavior of the employees working in the organization. It highlights the significance of Challenges and Opportunities of OB, perception, attribution, learning, organizational change, organizational culture, motivation, leadership and conflict management.

Course Outcome: On completion of this course, the students will be able to:

- Understand the behaviour of people in the organization.
- Analyze the complexities associated with management of individual behaviour in theorganization.
- Understand the motivation (why) behind behaviour of people in the organization.
- Cover the explanations about human behavior in the organizational context.
- Impact of individual, group and organizational factors on human behavior.
- Understand the concept of personality, learning and attitude.

Unit-I:

Organizational Behaviour- Meaning, Definition and importance, Foundations of OB, OB Models, and Challenges to OB.
Outcome: The students will be able to understand the conceptual framework of the discipline of OB, OB Models and its practical applications in the organizational set up.

Unit-II:

Individual Behaviour: Perception: Definition &Concept; Personality: Concept, Determinants and Personality Types (Type A and Type B, Big Five Model, MBTI Model); Learning: Concept and Theories (Classical and Operant Conditioning); Attitude: Components& Formation.
Outcome: The students will be able to interpret key concepts and theories of perception, learning with regard to individual differences and apply these appropriately to specific situations.

Unit-III:

Group Behaviour: Group Dynamics: Meaning, Formation and Types of Groups (Formal & Informal Groups), Stagesof Group Development, Individual vs. Group decision making.

Group vs Team. Types of Team. **Group Communication:** Communication Types, Communication Process, Barriers to communication; Effective Communication Methods. **Outcome:** The students will be able to interpret the key concepts and theories with regard to group behaviour and apply these appropriately to specific situations.

Unit-IV:

Motivation-Meaning, Nature &Importance. Motivational Theories (Maslow's Need Hierarchy Theory, Herzberg's two factor Theory, McClelland's Need Theory, Vroom's Expectancy Theory, Equity Theory); Motivational Challenges. **Leadership -** Leadership: Nature and Importance; Leadership Styles; Leadership Theories (Trait Theory, Behaviour Theory, Contingency Theory).
Outcome: The students will be able to understand how the organizational behavior can integrate in understanding the motivation behind behavior of people in the organization. Students also able to identify and develop effective motivational and leadership skills.

Text Books:

- ✓ *Organizational Behaviour: L.M. Prasad*
- ✓ *Organizational Behaviour: Rao &Narayana*
- ✓ *Organizational Behaviour: Gupta and Joshi (KP)*

Reference Books:

- ✓ *Organizational Behaviour: K Aswathappa(HPH)*
- ✓ *Organizational Behaviour: Stephen Robbins(PHI)*

Core IX- Project Work
Organizational Behavior

Guidelines for Project

Project is an assignment to strengthen the understanding of fundamentals through effective application of theoretical concept. The objective of the project course is to help the student develop ability to apply multidisciplinary concepts, tools and techniques to solve organisational problems. The project may be from any one of your areas related to the concerned subject.

Project report: The Project Report must have the following:

- Cover Page – must have the name and roll no. of the student and the name & designation of theguide along with the title of the Project.
- Acknowledgement, declaration, Certificate of originality signed by the guide with date
- Detailed tables & figures of contents with page nos.

- All pages of the Project Report must be numbered as reflected in Index of Chapters

Index of Chapters:

- Chapter-I: Introduction & Review of literatures
- Chapter-II: Research Methodology
- Chapter-III: Conceptual & Theoretical Descriptions
- Chapter-IV: Data Analysis & Interpretations
- Chapter-V: Conclusion, Findings, suggestions & Scope for further research.
- Chapter-VI: References, Annexures etc.

Core X **Foundation of Data Science and Data Analytics**

Course Objectives:

This course is intended to understand data management like data collection, processing, analysis, interpretation and visualization by applying quantitative modelling and data analysis techniques for real world business problems. The course also provides the knowledge of statistical data analysis techniques utilized in business decision making.

Course Outcome: On completion of this course the students will be able to

- Explain various software tools for data storage, analysis and
- Visualize the data.
- Choose EDA, inference and regression techniques.
- Apply R programming for analyzing statistical data for business decision making.
- Analyze different clustering methods for big data sets.

Unit-I:

Definition of Big Data, Big data characteristics & considerations, Data Repositories – analyst perspective, Business drivers for analytics, Typical analytical architecture, Business Intelligence Vs Data Science, Drivers of Big Data analytics, Role of data scientist in Big data ecosystem, Application of Big data analytics.

Outcome: The students will have to get Fundamentals of Big Data, Use software tools for data storage, analysis and visualization in big-data analytics.

Unit-II:

Need of Data analytic lifecycle, Key roles for successful analytic project, various phases of Data analytic lifecycle: Discovery, Data Preparation, Model Planning, Model Building, Communicating Results, Operationalization.

Outcome: The students can utilize EDA, inference and regression techniques.

Unit-III:

Introduction to R: GUI of R, Getting data into & out of R, Data types in R, Basic operations, Descriptive Statistics.

Outcome: The students can apply R programming for analyzing statistical data for business decision making.

Unit-IV:

Overview of Clustering, K- means, Association Rules, Apriori Algorithm, Linear Regression, Logistic Regression.

Outcome: The students can understand different clustering methods for big data sets.

Text Book:

- ✓ *David Dietrich, Barry Hiller, "Data Science & Big Data Analytics", EMC education services, Wiley publications,2012*

Reference Book:

- ✓ *Trevor Hastie, Robert Tibshirani, Jerome Friedman, "The Elements of Statistical Learning", Springer, Second Edition, 2011.*