

B.Sc. Forensic Science: Semester II

ESI 207: Computer Science II

Teaching Scheme

Lectures: 4 hrs/Week

Tutorials: 1 hr/Week

Credits: 4

Examination Scheme

Class Test: 12 Marks

Teachers Assessment: 6 Marks

Attendance: 12 Marks

End Semester Exam: 70 marks

Course outcomes:

After the completion of the course the students will be able to:

- Understands the basic concepts of data base management systems.
- Design E-R diagrams for real world applications.
- Formulate relational algebraic expressions using relational data models and languages.
- Apply normalization transaction properties and concurrency control to design database.
- Analyze the security algorithms for database protection.

Unit I – Database Management System

- Introduction: Database System Concepts, File system vs. database system, Database system architecture, Data models and their types, Data base scheme and instances, Data independence, Database Languages and Interfaces.

Unit II – Data Modeling Concepts

- ER model concepts: Notations for ER diagram, Extended E-R diagram, Extended E-R model, E-R model design issues, constraints, and keys: Weak entity set strong entity set, Relationships of higher degree.
- Relational model concepts: code rules, constraints, Relational Algebra operations, Extended relational algebra operations, Relational Calculus, Tuple and Domain relational calculus.

Unit III – Database Design

- Functional dependencies, Normal forms, First, second, and third normal forms, BCNF, Multi-valued dependencies and Fourth Normal form, Join Dependencies and Fifth Normal form.
- Transaction, Query Processing:
Transaction and system concepts: transaction states, ACID properties of transactions, concurrent execution schedules and Recoverability, Serializability of schedules.
Query Processing and Optimization: Measures of Query cost, Cost, Evaluation of expression.
Optimization: Transformation of relational expression, Choice of evaluation plan.

Unit IV – Concurrency Control

- Concurrency Control Techniques: Two phase Locking Techniques for Concurrency Control; Time stamping in Concurrency control.
- Introduction to SQL:
Basic Structure of SQL Query, Set operators, SELECT, UNION, INTERSECT, and EXCEPT, Nested queries, Aggregate function, Null values, Derived Relations, Modification of the Database, Joined relations and up-dates in SQL.

Unit V – Database Security

- Importance of data, Threats and risks, Users and database privileges, Access Control, Security for Internet Applications, Role of Database Administrator.

Head

Department of Biotechnology

Dean

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