

Object Oriented Programming and Data Structure (CoE135)

Course Description:

The course gives the fundamentals of object-oriented programming, Identify data structures useful to represent specific types of information, and also gives an introduction to database systems and data modeling, architectures, and Fundamental concepts of structured query language.

Course Topics:

1. **Object-oriented programming in C++:** Class hierarchies, object, Encapsulation, Abstraction, Polymorphism, Dynamic binding, Message passing, Messages Association, Interfaces, inheritance, and Operator overloading.
2. **Data Structures:** Pointers and references, Linked structures, Implementation strategies for stacks, queues, and hash tables, Implementation strategies for graphs and trees, Strategies for choosing the right data structure.
3. **Database systems:** definition and role in computer engineering, Components, Database management system (DBMS), Database architectures (possibilities, concept, data independence), and query.
4. **Data modeling:** Concepts (key, foreign key, record, relation), Conceptual models (possibilities, entity-relationship model and UML; strengths and weaknesses), and object oriented models.
5. **Structured query language (SQL):** Fundamental concepts including data definition, query formulation, update sub-language, constraints, and integrity.

References:

- **Object Oriented Programming in C++, 4th Edition by Robert Lafore.**
- **Object Oriented Programming with C++, 4th Edition by E. Balagurusamy.**
- **C++ Plus Data Structure. 3rd Edition, by Nell Dale.**
- **Fundamentals of Database Systems, 6th Edition, by Ramez Elmasri and Shamkant B.Navathe.**