Course Title: Decision Support System
Course No: CSC-460
Credit Hrs: 3

Full Marks: 60 + 20 +20
Pass Marks: 20 + 8 + 8

Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)

Course Synopsis: This course covers introduction to decision support systems; DSS components; Decision making; DSS software and hardware; developing DSS; DSS models; types of DSS; data mining; artificial intelligence and expert Systems.

Goal: The course is devoted to introduce decision support systems; show their relationship to other computer-based information systems, demonstrate DSS development approaches, and show students how to utilize DSS capacities to support different types of decisions.

Course Contents:

Unit 1: Decision Making and Computerized Support

Managers and Decision-Making; Managerial Decision-Making and Information Systems; Managers and Computer Support; Computerized Decision Support and the Supporting Technologies; A Framework for Decision Support; The Concept of Decision Support Systems; Group Support Systems; Enterprise Information Systems; Knowledge Management Systems; Expert Systems; Artificial Neural Networks; Advanced Intelligent Decision Support Systems; Hybrid Support Systems


Unit 2: Decision Support Systems

DSS Configurations; What Is a DSS?; Characteristics and Capabilities of DSS; Components of DSS; The Data Management Subsystem; The Model Management Subsystem; The User Interface (Dialog) Subsystem; The Knowledge-Based Management Subsystem; The User; DSS Hardware; DSS Classifications

2.2. Modeling and Analysis 4 Hrs.
MSS Modeling; Static and Dynamic Models; Certainty, Uncertainty, and Risk; Influence Diagrams; MSS Modeling with Spreadsheets; Decision Analysis of a Few Alternatives (Decision Tables and Decision Trees); The Structure of MSS Mathematical Models; Mathematical Programming Optimization; Multiple Goals, Sensitivity Analysis, What-If, and Goal Seeking; Problem-Solving Search Methods; Heuristic Programming; Simulation; Visual Interactive Modeling and Visual Interactive Simulation; Quantitative Software Packages; Model Base Management

2.3. Business Intelligence: Data Warehousing, Data Acquisition, Data Mining, Business Analytics, and Visualization 4 Hrs.
The Nature and Sources of Data; Data Collection, Problems, and Quality; The Web/Internet and Commercial Database Services; Database Management Systems in Decision Support Systems/Business Intelligence; Database Organization and Structures; Data Warehousing; Data Marts; Business Intelligence/Business Analytics; Online Analytical Processing (OLAP); Data Mining; Data Visualization, Multidimensionality, and Real-Time Analytics; Geographic Information Systems; Business Intelligence and the Web: Web Intelligence/Web Analytics

2.4. Decision Support System Development 3 Hrs.
Introduction to DSS Development; The Traditional System Development Life Cycle; Alternative Development Methodologies; Prototyping: The DSS Development Methodology; Change Management; DSS Technology Levels and Tools; DSS Development Platforms; DSS Development Tool Selection; Team-Developed DSS; End User Developed DSS; Putting The DSS Together

Unit 3: Knowledge Management

3.1. Knowledge Management 5 Hrs.
Introduction to Knowledge Management; Organizational Learning and Transformation; Knowledge Management Initiatives; Approaches to Knowledge Management; Information Technology in Knowledge Management; Knowledge Management Systems Implementation; Roles of People in Knowledge Management; Ensuring Success of Knowledge Management

Unit 4: Intelligent Decision Support Systems


4.2. Knowledge Acquisition, Representation, and Reasoning 5 Hrs.
Concepts of Knowledge Engineering; Scope and Types of Knowledge; Methods of Knowledge Acquisition from Experts; Knowledge Acquisition from Multiple Experts; Automated Knowledge Acquisition from Data and Documents; Knowledge Verification and Validation; Representation of Knowledge; Reasoning in Rule-Based Systems; Explanation and
Metaknowledge; Inferencing with Uncertainty; Expert Systems Development; Knowledge Acquisition and the Internet

4.3. Advanced Intelligent Systems  5 Hrs.
Machine-Learning Techniques; Case-Based Reasoning; Basic Concept of Neural Computing; Learning in Artificial Neural Networks; Developing Neural Network-Based Systems; Genetic Algorithms Fundamentals; Developing Genetic Algorithm Applications; Fuzzy Logic Fundamentals; Developing Integrated Advanced Systems

4.4. Intelligent Systems over the Internet  3 Hrs.
Web-Based Intelligent Systems; Intelligent Agents: An Overview; Characteristics of Agents; Why Intelligent Agents?; Classification and Types of Agents; Internet-Based Software Agents; DSS Agents and Multi-Agents; Semantic Web: Representing Knowledge for Intelligent Agents; Web-Based Recommendation Systems; Managerial Issues of Intelligent Agents

Laboratory Work: The laboratory should contain the concepts of artificial intelligence that are applicable to the development of decision support systems.

Reference Books:
2. Decision Support Systems, A Knowledge-Based Approach, Clyde W. Holsapple and Andrew B. Whinston
3. Decision Support Systems For Business Intelligence by Vicki L. Sauter