

## Intelligent Databases

**Course Title:** Intelligent Databases

**Course Code:** ITF303

**Credit Hours:** 3

**Knowledge Domain:** IT Foundations.

**Prerequisite(s):** Database Systems (ITF302)

### Learning Objectives:

Upon completion of this course, the student will be able to:

1. Grasp the basic concepts of knowledge and expert systems.
2. Illustrate information retrieval and multidimensional indexing.
3. Acquire the elements of data mining and knowledge discovery in databases.

### Learning Outcomes

1. Grasping the basic components of intelligent databases with representative examples such as expert systems.
2. Grasping the basic index structures and multidimensional indexing.
3. Acquaintance with data mining concepts.

### Overview and Syllabus

Introduction to intelligent databases. Expert systems. Knowledge representation and hypermedia. Information Retrieval (IR). Basic index structures and multidimensional indexing. Design considerations for intelligent databases. Introduction to data mining concepts.

### Course Outline

	<b>Topic</b>
1	<b><u>Module 01: Introduction to Intelligent Databases</u></b> Introduction Objectives <b>Lesson 01:</b> Definition and Evolution of Intelligent Databases <b>Lesson 02:</b> Current Trends in Information Technology <b>Lesson 03:</b> The Different Levels of Intelligence Summary Assessment
2	<b><u>Module 02: Introduction To Information Retrieval</u></b> Introduction Objectives

	<p><b>Lesson 01:</b> Basic Definitions And The Nature Of IR.</p> <p><b>Lesson 02:</b> An Example Information Retrieval Problem And The Inverted Index</p> <p><b>Lesson 03:</b> Processing Boolean Queries</p> <p><b>Lesson 04:</b> Information Retrieval Model Types</p> <p>Summary</p> <p>Assessment</p>
3	<p><b><u>Module 03: The Term Vocabulary and Postings Lists</u></b></p> <p>Introduction</p> <p>Objectives</p> <p><b>Lesson 01:</b> Document Delineation And Character Sequence Decoding</p> <p><b>Lesson 02:</b> Determining The Vocabulary Of Terms</p> <p><b>Lesson 03:</b> Faster Postings List Intersection Via Skip Pointers</p> <p>Summary</p> <p>Assessment</p>
4	<p><b><u>Module 04: Index Construction And Compression</u></b></p> <p>Introduction</p> <p>Objectives</p> <p><b>Lesson 01:</b> Index Construction</p> <p><b>Lesson 02:</b> Statistical Properties Of Terms In Information Retrieval</p> <p><b>Lesson 03:</b> Dictionary And Postings Compression</p> <p>Summary</p> <p>Assessment</p>
5	<p><b><u>Module 05: Scoring, Term Weighting And The Vector Space Model</u></b></p> <p>Introduction</p> <p>Objectives</p> <p><b>Lesson 01:</b> Parametric and Zone Indexes</p> <p><b>Lesson 02:</b> Term Frequency and Weighting</p> <p><b>Lesson 03:</b> The Vector Space Model for Scoring</p> <p><b>Lesson 04:</b> Variant TF-IDF Functions</p> <p>Summary</p> <p>Assessment</p>
6	<p><b><u>Module 06: Web Search Basics</u></b></p> <p>Introduction</p> <p>Objectives</p> <p><b>Lesson 01:</b> Background and Web Characteristics</p> <p><b>Lesson 02:</b> Advertising as the Economic Model</p> <p><b>Lesson 03:</b> Index Size and Estimation</p> <p>Summary</p> <p>Assessment</p>
7	<p><b><u>Module 07: Web Crawling and Indexes</u></b></p> <p>Introduction</p> <p>Objectives</p> <p><b>Lesson 01:</b> Overview and Crawling</p> <p><b>Lesson 02:</b> Distributing Indexes</p> <p><b>Lesson 03:</b> Connectivity Servers</p> <p>Summary</p>

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