

**CENTRAL UNIVERSITY OF KERALA  
DEPARTMENT OF COMPUTER SCIENCE  
M.Sc. COMPUTER SCIENCE**

ELECTIVE COURSE					
COURSE CODE	COURSE TITLE	CONTACT HRS/WEEK			CREDITS
		LEC	LAB	TUT	
CSC5007	Multimedia Database Systems	2	2	1	4

Lec = Lecture, Tut = Tutorial, Lab = Practical

This is an experimental and **skill based course**.

Course Objective:

The objective of the course is to provide theoretical and practical aspects of multimedia database systems.

By completing this course, students will obtain the following course/learning outcomes:

1. Knowledge gained:
  - (i) State of art methods in multimedia database systems
2. Skill gained:
  - (ii) Skills in developing algorithms and methods for multimedia databases
3. Competency gained:
  - (iii) Developing multimedia systems for various applications

Prerequisites: Basic knowledge of databases

Grading:

Lab implementation	– 10%
Assignment/Quiz/presentation	– 10%
Class Test	– 10%
Lab test	– 10%
Final Exam	– 60%

### CSC5007 – Multimedia Database Systems

#### Module 1

Basics: Architecture of Multimedia Database System, Performance Measures for evaluating Multimedia Database System – Accuracy, Precision, Recall, F-Measure, R-Norm. Multidimensional Data Structures: k-d Trees, Quadrees, R-Trees, G-Tree, comparison of Different Data Structures.

#### Module 2

Image Databases: Image Formats, overview of image processing steps, feature extraction techniques for images – Color, Shape, Texture and Spatial features. Study on archival and retrieval of images for exact and similarity retrieval. Indexing techniques for archival of images using B-Tree, R-Tree, G-Tree for both conventional as well as spatial layout representation. Text/Document Databases: Stop Lists, Word Stems, and Frequency Tables. Study on text representation using Vector Space Model, Term Document Frequency representation, Latent Semantic Indexing, Other Retrieval Techniques. Recent research development in text database management system.

#### Module 3

Video Databases: Organizing Content of a Single Video, video segmentation, Keyframe extraction, video summarization, video archival and retrieval using conventional representation schemes. Introduction to semantic based video archival and retrieval systems. Recent developments in video database system. Audio Databases A General Model of Audio Data, Capturing Audio Content through Discrete Transformation, Indexing Audio Data.

#### Module 4

Design and Architecture of a Multimedia Database, Organizing Multimedia Data Based on The Principle of Uniformity, Media Abstractions, Query Languages for Retrieving Multimedia Data, Indexing SMDSS with Enhanced Inverted Indices, Query Relaxation/Expansion, Web-based multimedia applications.

#### References

1. V.S. Subrahmanian, *Principles of Multimedia Database Systems*, Morgan Kauffman, 2nd Edition, 2013.
2. Shashi Shekhar, Sanjiv Chawla, *Spatial Databases*, Pearson Education, 2002.
3. Lynne Dunckley, *Multimedia Databases- An object relational approach*, Pearson Education, 2003.
4. B. Prabhakaran, *Multimedia Database Systems*, Kluwer Academic, 1997