Multimedia Database (CSC- 456)
Tribhuvan University
Institute of Science and Technology
Bachelor of Science in Computer Science and Information Technology
Soch College of Information Technology

Course Title: Multimedia Database
Course No: CSC- 456 ---------- **Full Marks:** 60+20+20
Credit hours: 3 ----------**Pass Marks:** 24+8+8
Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)
Course Synopsis: Advanced aspects of multimedia database, indexing and retrieval
Goal: To study advanced aspects of indexing, storage device, retrieval of multimedia information encompassing the principles, research results and commercial application of the current technologies.

Course Contents:

Unit 1: Multimedia Introduction ---------- 3 Hrs.
Introduction to multimedia database, issues related to multimedia data types, media types, text document information retrieval, indexing.

Unit 2: Multimedia Data types and formats----------3 Hrs.
Text, Vector graphics and animation, digital images and digital video, major characteristics and requirement of multimedia data and applications

Unit 3: Multimedia database design issues---------- 2 Hrs.
MIRS architecture, data models and user interface, User interface design and feature Extraction, indexing and similarity measures

Unit 4: Text Document Indexing and retrieval ---------- 5 Hrs.
Automatic text document indexing and Boolean Retrieval model, Vector space retrieval model, probabilistic model and cluster-based retrieval model, Nontraditional IR methods, Performance measurement, WWW search engines

Unit 5: Indexing and retrieval of audio ---------- 2 hrs.
Audio properties and classification, Speech recognition and retrieval, Music indexing and retrieval

Unit 6: Image Indexing and retrieval----------5 Hrs.
Color-based image indexing and retrieval techniques, Image retrieval based on shape, on texture, Compressed image data, integrated image indexing

Unit 7: Multimedia Indexing and retrieval ---------- 5 Hrs.

Video shot detection or segmentation, video indexing and retrieval, Video representation and abstraction, Architecture of multimedia information management, user interface with example

Unit 8: Techniques and data structures for efficient multimedia similarity search----------- 5 hrs.
Filter process, B+ and B trees, Clustering, Multidimensional B+ tree, K-d trees, Grid files, Tree family

Unit 9: System support for distributed multimedia databases ----------5 Hrs.
QoS management , Design goals, Data storage devices and management , Data placement on disks, Disks scheduling and admission control, Server configuration and network connection

Unit 10: Multimedia computer architecture and operating systems ---------- 4 Hrs.
Process architecture, Computer architecture, Design issues of MOS, QoS support, Multimedia network, Transport protocols, Synchronous presentation

Unit 11: Measurement of multimedia information retrieval effectiveness ---------- 3 Hrs.
Human Judgment data, Recall and precision pari, Percentage of weighted Hits, Similarity Ranking, Factors affecting retrieval effectiveness

Unit 12: Products, application and new development ---------- 3 Hrs.
Multimedia search engine, Digital libraries, Video- on-demand, Multimedia security, MPEG- 7, Multimedia database applications

Laboratory Work: There should be lab related to Multimedia Database

Reference books:
1. Gunjoun Lu, Multimedia database management systems
2. G. Lu, Multimedia Database Management Systems, Artech House , 1999.
3. T.Shih, Distributed Multimedia Databases: Techniques and Application , IRM Press, 2002.
4. V.S. Subrahmanian , Principles of Multimedia Database Systems, Morgan Kaufmann, 1998.