BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani
Pilani Campus
AUGS/ AGSR Division

SECOND SEMESTER 2020-21
COURSE HANDOUT

Date: 18.01.2021

In addition to part I (General Handout for all courses appended to the Time table) this portion gives further specific details regarding the course.

Course No : **CS F401**
Course Title : **Multimedia Computing**
Instructor-in-Charge : **MUKESH KUMAR ROHIL**
Instructor(s) : **None**
Tutorial/Practical Instructors: None

1. Course Description: Introduction to multimedia; media & data streams; text, graphics, image, color-science, audio, animation, video and other media types, graphics, image, video & audio file formats; image & video processing, synthesis of sound signal; text, graphics, and image coding & compression, video & audio codecs, media integration, access to multimedia, spoken language interface; algorithm vs. architecture based approaches, storage technologies multimedia documents, multimedia user interfaces, multimedia databases, multimedia communication systems, multimedia synchronization, multimedia operating systems, multimedia applications architecture and future directions.

2. Scope and Objective of the Course: The aim of this course is to introduce the concepts of multimedia computing techniques as used for various data streams, multimedia networks, operating systems and architecture. Emphasis will be given to theoretical, algorithmic and advanced architectural aspects of multimedia system design. After successful completion of the course students should be able to apply the concepts and techniques to various problem domains concerned with multimedia based applications and solutions.

3. Text Books:
T1: Ze-Nian Li & Mark S. Drew, "Fundamentals of Multimedia", Pearson Education, 2004
T2: Steinmetz R & Nahrstedt K, “Multimedia: Computing, Communication & Applic ations”, Pearson Education, 2001

4. Reference Books:
R1. Rao K R & Hwang J J, “Techniques & Standards for Image, Video & Audio Coding”, PH-PTR ,95
R2. Jeffcoate J, “Multimedia in Practice – Technology & Applications”, PHI, (Indian Reprint 1998)
R3. Fred Halsall, “Multimedia Communications”, Pearson Education, Indian Print, 2001

5. Course Plan:

Module No.	Lecture Sessions	Reference	Learning outcomes
01	2	T1: 1 T2: 1	Multimedia: Definitions, Applications, Multimedia Tools
02	1	T2: 2	Media and Streams, Multimedia System Architecture
03	2	T1: 3	Image: Representation, Formats & Processing
04	2	T1: 4	An introduction to Color Science, Color Models in images & video
05	1	T1: 5 T2: 5.1, 5.2	Fundamental Concepts in Video
06	2	T1: 6 T2: 3	Audio: Fundamentals of Audio & Speech Processing and coding

Module No.	Lecture Sessions	Reference	Learning outcomes
07	1	T2: 6.1, 6.2, 6.3	Need for compression in multimedia, A classification of compression techniques in multimedia
08	2	T1: 7, 8, 9	Image Compression Fundamentals & Standards
09	2	T1: 10, 11, 12	Video Compression Fundamentals & Standards
10	2	T1: 13, 14	Audio Compression Fundamentals & Standards
11	2	T2: 7 + Class Notes	Storage Media for Multimedia
12	1	T2: 9.1, 9.2, 9.3	Multimedia Operating Systems: Resource Management
13	2	T2: 9.4 Class Notes	Multimedia Operating Systems: Process Management
14	3	T2: 9.5, 9.7 Class Notes	Multimedia Operating Systems: File System & Disk Scheduling Algorithms, Architecture
15	3	T2: 11.1, 11.2, 11.3, 11.4	Multimedia communication systems: Application, Transport subsystems, QoS, Resource Management & the trends
16	2	T2: 12.1, 12.2, 12.3, 12.4	Multimedia Database Management Systems(MDBMS): Characteristics, Data Analysis, Data Structure & Operations
17	1	T2:13	Overview of Multimedia Document, Hypertext & MHEG
18	1	T2: 14	Overview of Multimedia User Interface
19	3	T2: 15	Synchronization: Notion of synchronization, Presentation Requirements, Reference Model & Specification
20	2	T2: 17	Multimedia Application Architecture
21	1	T2: 18	Future directions

6. Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of component (Close Book/ Open Book)
Mid-Semester Test	90 Min.	35%	<TEST_1> As per AUGSD Notice	**Open Book**
Comprehensive Examination	2 hours	40%	<TEST_C> Tuesday, May 11, 2021 (FN)	**Open Book**
Quiz	25 Min.	10%	Wednesday, Feb 17, 2021 02:00 PM to 02:25 PM	**Open Book**
Project/Assignment	15 days	15%	Details will be displayed later	**Open Book and Take home**

7. Chamber Consultation Hour: W-8 (03:00 PM – 03:50 PM), Via Google Meet.

8. Notices: will be displayed on the course web-page hosted on Nalanda server (On-campus LMS).

9. Make-up Policy: Make-up may be granted only in genuine cases if student has given prior information of his/her reason of absence from the regular examination/test.

10. Note (if any): If the marks-histogram emerges as not skewed, then a student getting marks, say marks *m* out of maximum marks, *MM*, such that (MM*m/*Acut*) < 15*(*MM*/100), where *Acut* is the cutoff (recommended as per the histogram) for A grade, may be recommended to be reported an NC.

Instructor-in-charge
Course No. CS F401