Lesson Plan

Course: MCA-102 – Data and File Structures		
MCA – 3rd Semester	No. of Theory Hours per Week: 04	No. of Practical Hours per Week: 02

Course Outcomes (COs):

COs for Practical (MCA-162)	
CO$_1$	Explain the technical aspects of multimedia systems. (BTL2)
CO$_2$	Apply various file formats of audio, video and text media in different applications. (BTL3)
CO$_3$	Analyze the QoS parameters of various multimedia applications through internet. (BTL4)
CO$_4$	Evaluate different types of multimedia compression methods. (BTL4)
CO$_5$	Design interactive multimedia software applications using animations. (BTL4)
CO$_6$	Develop real-time multimedia applications using different multimedia components. (BTL6)

Recommended Books:

Books	S. No.	Details of the Books
Text Books	1.	John Vince, "Virtual Reality Systems", Pearson Education, 8th Edition, 2014 **[TB1]**
	2.	TB2. Fred Halsall, "Multimedia Communications: Applications, Networks, Protocols and Standards", Pearson, 1st Edition, 2013. **[TB2]**
	3.	Tay Vaughan, "Multimedia-Making it Works", McGraw-Hill, 9th Edition, 2014. **[TB3]**
Reference Books	1.	Ze-Nian Li, Mark S. Drew, Jiangchuan Liu, "Fundamentals of Multimedia", Springer, 2nd Edition, 2014. **[RB1]**
	2.	Ralf Steinmetz and Klara Naharstedt, "Multimedia: Computing, Communications & Applications", Pearson, 1st Edition, 2014. **[RB2]**
	3.	K. Andleigh and K. Thakkar, "Multimedia System Design", PHI, 1st Edition, 2015. **[RB3]**
	4.	Keyes, "Multimedia Handbook", TMH, 2nd Edition, 2000. **[RB4]**

	5.	Khalid Sayood, "Introduction to Data Compression", Elsevier, 5th Edition, 2017. **[RB5]**

Lesson Plan for Theory:

Lecture No.	Topics/Concepts to be Covered	Reference of the Book and its Chapter
UNIT - I		
1.	Introductory Concepts: Multimedia – Definitions, CD-ROM Technology and the Multimedia Highway	TB1 [Chapters 1] TB3 [Chapters 1-4, 7, 8]
2.	Applications of Multimedia, Introduction to Multimedia Projects – The Stages of Project	
3.	, Requirements to make Good Multimedia, Multimedia Skills and Training, Introduction to Virtual Reality,	
4.	Challenges in Multimedia Technologies. Multimedia-Hardware and Software: Multimedia Hardware – Macintosh and Windows Production Platforms,	
5.	Memory and Storage Devices, Multimedia Software – Basic Tools, Making Instant Multimedia.	
6.	Multimedia Building Blocks: Text, Sound, Images, Animation and Video, Image Color Schemes,	
7.	Digitization of Audio and Video objects.	
8.	Assembling and Delivering a Project: Planning and Costing	
9.	Designing and Producing, Content and Talent, Delivering	
10.	Designing and Producing, Content and Talent, Delivering	
UNIT – II		
11.	Animation: Introduction, Basic Animation Techniques	TB1 [Chapter 7] TB3 [Chapters 5, 6]
12.	Motion Graphics-2D & 3D Animation - Cell Animation,	
13.	Computer Animation, Tweening & Morphing	
14.	Dynamics, Kinematics, Reverse Kinematics	
15.	Video and Animation: Video Basics, How Video works, Analog Video, Digital Video,	

Lecture No.	Topics/Concepts to be Covered	Reference of the Book and its Chapter
16.	Video Recording and Tape Formats, Shooting and Editing Videos.	
17.	Exposure of Multimedia Tools: Authoring Tools	
18.	Modelling, Rendering,	
19.	Texture Shading	
20.	Different File Formats.	
UNIT – III		
21.	Compression Fundamentals: Need for Compression,	TB2 [Chapter 3, 4] TB3 [Chapter 4]
22.	Lossless and Lossy Compression,	
23.	Taxonomy of Compression Algorithms,	
24.	Basics of Information Theory.	
25.	Text Compression: Huffman Coding, Dynamic Huffman Coding,	
26.	Arithmetic Technique.	
27.	Entropy Encoding: Run Length Coding,	
28.	Lempel-Ziv-Welch (LZW) Algorithm.	
29.	Source Coding: Transform Coding- JPEG,	
30.	MPEG, Audio Compression-MP3, Statistical Coding-Pattern Substitution	
UNIT - IV		
31.	Multimedia Communication and Applications: Multimedia Information Representation,	TB2 [Chapters 1, 2, 5, 7, 8]
32.	Multimedia Networks, Integrated Services, RSVP- Differentiated Services, Multimedia on 4G/5G Networks,	
33.	Standards for Multimedia Communications - Interpersonal Communication, Multimedia Conferencing,	
34.	Interactive Application over Internet, Entertainment Applications and Interactive Television.	
35.	Multimedia and Internet: IP Datagram, Fragmentation and Reassembly,	
36.	QoS Support, IPv4/IPv6 Interoperability,	
37.	Designing for WWW- Audio, Video.	

Lecture No.	Topics/Concepts to be Covered	Reference of the Book and its Chapter
	Modes.	
38.	Digital Communication: Transmission Mode, Asynchronous, Synchronous and Isochronous Transmission Modes	
39.	Streaming: Stored Audio and Video, Best-Effort Service,	
40.	Protocols for Real-Time Interactive Applications, Scheduling and Policing Mechanism.	

Course: MCA-162 – Data and File Structures Lab.	
MCA – 2ⁿᵈ Semester	**No. of Practical Hours per Week: 02**

Course/Lab Outcomes (COs):

COs for Practical (MCA-162)	
CO$_1$	Demonstrate modelling of 2D and 3D graphical scenes using Open Graphics Library suits. (BTL2)
CO$_2$	Apply various delivery methods including streaming. (BTL3)
CO$_3$	Analyze audio and text compression algorithms. (BTL4)
CO$_4$	Examine video compression algorithms (BTL4)
CO$_5$	Create 2D animation applications using appropriate multimedia tools. (BTL4)
CO$_6$	Develop customized multimedia projects using different components. (BTL6)

Lesson Plan for Practical:

Week No.	Lab No.	Topics/Concepts to be Covered	Reference of Lab Manual
1.	1.	Make a Pencil Model using Blender	
2.	2.	Make a Sofa Model using Blender	
3.	3.	Make a Smiley Model using Blender	
4.	4.	Make a Candle Model using Blender	
5.	5.	Create an animation of a bouncing ball using Blender	
6.	6.	Create an animation of sliding wooden log making other small wooden blocks slide and eventually fall out of the platform	
7.	7.	Create an animation of an arrow embedded into a circle revolving around its center	
8.	8.	Create a model of a hammer. After modelling, add material and texture to it.	
9.	9.	Create a model of lamp and render it.	

Testing Schedule:

Nature of Test	May	June	July	
Surprise Test (ST)	ST in any of the Weeks	-	-	-

Nature of Test	May	June	July	
Mid Term Test (MT)	-	TBAL	-	-
Class Test (CT)	-	-	CT in any of the Weeks	-
Supplementary Test (Sp. T)	-	-	Sp. T in 1st Week	
Assignment Submission Schedule	**Assignment-1** is to be submitted One Week after completion of Unit-1 and Unit-2. **Assignment-2** is to be submitted One Week after completion of Unit-3. **Assignment-3** is to be submitted One Week after completion of Unit-4.			