INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

INFORMATION TECHNOLOGY

COURSE DESCRIPTION FORM

Course Title	Multimedia and Rich Internet Applications			
Course Code	A80547			
Course Structure	Lectures	Tutorials	Practicals	Credits
	4	-	-	4
Course Coordinator	Mrs. B.Dhanalaxmi, Associate Professor, IT			
Team of Instructors	Mrs. B.Dhanalaxmi, Associate Professor, IT			

I.   COURSE OVERVIEW:

This course covers the concepts and principles that underlie the transmission of continuous media such as digital audio and video across packet-switched computer networks. We alternate the topics in multimedia applications and tools, and multimedia networking. Although some basic concepts on media compression, retrieval, and applications are enhanced. The majority of the class time will be devoted to multimedia networking techniques. Introduction to Ajax- Enabled rich internet application is discussed with Dojo Toolkit.

II.   PREREQUISITE(S):

Level	Credits	Periods	Prerequisite
UG	4	5	Web Technologies

III.   MARKS DISTRIBUTION

Sessional Marks	University End Exam Marks	Total Marks
There shall be 2 midterm examinations. Each midterm examination consists of subjective test. The subjective test is for 20 marks, with duration of 2 hours. Subjective test of each semester shall contain 5 one mark compulsory questions in part-A and part-B contains 5 questions, the student has to answer 3 questions, each carrying 5 marks. First midterm examination shall be conducted for the first two and half units of syllabus and second midterm examination shall be conducted for the remaining portion. Five marks are earmarked for assignments. There shall be two assignments in every theory course. Marks shall be awarded considering the average of two assignments in each course	75	100

IV.   EVALUATION SCHEME:

1.	I Mid Examination	80 minutes	20
2.	I Assignment	-	5
3.	II Mid Examination	80 minutes	20
4.	II Assignment	-	5
5.	External Examination	3 hours	75

V.   COURSE OBJECTIVES:

I.   Explain the fundamental concepts of text and image, overview of multimedia software tools.
II. Discuss the type of video signals, digitization of sound, compression algorithms standards.
III. Demonstrate the Case Study on MPEG Audio compression.
IV. Explain V' jorking with advanced component development, visual effects and multimedia.
V.   Discuss Rich internet applications with Ajax and Dojo Toolkit.

VI.   COURSE OUTCOMES:

At the end of the course the students are able to:

1. Recall the color models in images, color models in video, graphics and image data representation.
2. List different image representation techniques and file formats.
3. Sketch the differences between lossless compression and lossy compression.
4. Recall the importance of quantization and transmission of audio.
5. List the importance of social networking, social media, tagging, and social marking.
6. Apply the concepts of location based services in Rich internet applications.
7. Apply the concepts of Rich internet applications with Adobe flash for developing a Flash Movie.
8. List the importance of visual effects using multimedia on any video.
9. Sketch the importance of Ajax used for traditional web applications using xmlhttprequest object.
10. Recall the applications of Ajax in various web applications.

VII.   HOW PROGRAM OUTCOMES ARE ASSESSED:

Program Outcomes		Level	Proficiency assessed by
PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	**H**	Assignment, Exercises
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	**S**	Exercises
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet	**S**	Exercises

	the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.		
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.	**N**	……..
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.	**H**	Design, Exercises
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.	**N**	……..
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	**H**	Assignment, Exercises
PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	**N**	……..
PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	**H**	Workshop
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	**S**	Seminars, Paper presentations
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	**H**	Design Exercises, Discussions
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	**S**	Exams, Discussions

VIII. HOW PROGRAM SPECIFIC OUTCOMES ARE ASSESSED:

Program Specific Outcomes		Level	Proficiency assessed by
PSO1	**Professional Skills:** The ability to research, understand and implement computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient analysis and design of computer-based systems of varying complexity.	H	Lectures, Assignments
PSO2	**Software Engineering practices:** The ability to apply standard practices and strategies in software service management using open-ended programming environments with agility to deliver a quality service for business success.	H	Projects
PSO3	**Successful Career and Entrepreneurship:** The ability to employ modern computer languages, environments, and platforms in creating innovative career paths, to be an entrepreneur, and a zest for higher studies.	S	Guest Lectures

IX. SYLLABUS:

UNIT-I
Fundamental concepts in Text and Image: Multimedia and hypermedia, World Wide Web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

UNIT-II
Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.
Multimedia Data Compression: Lossless compression algorithms, Lossy compression algorithms, Image compression standards.

UNIT III
Basic Video compression techniques, Case study: MPEG Video Coding I, Basic Audio compression techniques, Case study: MPEG Audio compression.

Web 2.0:
What is web 2.0, Search, Content Networks, User Generated Content, Blogging, Social Networking, Social Media, Tagging, Social Marking, Rich Internet Applications, Web Services, Mashups, Location Based Services, XML, RSS, Atom, JSON, and VolP, Web 2.0 Monetization and Business Models, Future of the Web.

UNIT -IV
Rich Internet Applications (RIAS) with Adobe Flash: Adobe Flash Introduction, Flash Movie Development, Learning Flash with Hands-on Examples, Publish your flash movie, Creating special effects with Flash, Creating a website splash screen, action script, web sources.
Rich Internet Applications (RIAs) with Flex 3 – Introduction, Developing with Flex 3, Working with Components, Advanced Component Development, Visual Effects and Multimedia,

UNIT-V

Ajax- Enabled Rich Internet Application: Introduction, Traditional Web Applications vs Ajax Applications, Rich Internet Application with Ajax, History of Ajax, Raw Ajax example using xmlhttprequest object, Using XML, Creating a full scale Ajax Enabled application, Dojo Toolkit.

TEXT BOOKS
1. Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI Learning, 2004
2. Professional Adobe Flex 3, Joseph Balderson, Peter Ent, et al, Wrox Publications, Wiley India, 2009.
3. AJAX, Rich Internet Applications, and Web Development for Programmers, Paul J Deitel and Harvey M Deitel, Deitel Developer Series, Pearson Education.

REFERENCE BOOKS
1. Multimedia Communications: Applications, Networks, Protocols and Standards, Fred Halsall, Pearson Education, 2001, rp 2005.

2. Multimedia Making it work, Tay Vaughan, 7th edition, TMH, 2008.

3. Introduction to multimedia communications and Applications,Middleware, Networks, K.R.Rao, Zoran, Dragored, Wiley India, 2006, rp. 2009.

4. Multimedia Computing, Communications & Applications, RaIf Steinmetz and Klara Nahrstedt, Pearson Education, 2004

5. Principles of Multimedia, Ranjan Parekh, TMH, 2006.

6. Multimedia in Action, James E.Shuman, Cengage Learning, 198, rp 2008.

7. Multimedia Systems design, Prabhat K. Andleigh, Kiran Thakrar, PHI, 1986.

8. Multimedia and Communications Technology, Steve Heath, Elsevier, 1999, rp 2003.

9. Adobe Flash CS3 Professional, Adobe press, Pearson Education, 2007.

10. Flash CS3 Professional Advanced, Russel Chun, Pearson Education, 2007.

11. Flash CS5, Chris Grover, O'Reilly, SPD, 2010.

12. SAMS Teach yourself Adobe flash 053, Pearson Education, 2007.

13. Flex 4 Cookbook, Joshua Noble, etal, O'Peilly,SPD 2010.

14. Flex3 — A beginner's guide, Michele E.Davis, Jon A,Phillips, TMH,2008.

15. Mastering Dojo,R.Gill,C.RieCke and A,Russell,SPD

X. COURSE PLAN:

At the end of the course, the students are able to achieve the following course learning outcomes

Lecture No.	Course Learning Outcomes	Topics to be covered	References
1	**Understand** the Fundamental concepts in Text and Image.	Fundamental concepts in Text and Image	T1:1-4
2	**Understand** Basic Structure of Multimedia and hypermedia.	Multimedia and hypermedia	T1:5-7
3	**Discuss** World Wide Web	World Wide Web	T1:8-12
4	**Learn** Overview of multimedia software tools	Overview of multimedia software tools	T1:14-17
5-6	**Understand** Graphics and image data representation	Graphics and image data representation	T1:60-67
7	**Discuss** on Different types of File formats.	File formats	T1:71-79
8-9	**Discuss** about Color in image and video.	Color in image and video: color science	T1:82-100
10	**Analyze** Color models in images.	Color models in images	T1:100-102
11	**Analyze** Color models in video	Color models in video.	T1:104-107
12	**Discuss** Fundamental concepts in video and digital audio	Types of video signals	T1:112-113
13	**Understand** the Fundamental concepts **of** Analog videos	Analog video	T1:113-119
14	**Understand** the Fundamental concepts **of** Digital videos	Digital video	T1:119-122
15	**Discuss** on Digitization of sound.	Digitization of sound	T1:126-137
16	**Understand** the concept of MIDI	MIDI	T1:139-147
17	**Understand** Quantization and transmission of audio	Quantization and transmission of audio	T1:147-158
18	**Discuss** Multimedia Data Compression	Multimedia Data Compression	T1:165
19	**Discuss** Lossless compression algorithms	Lossless compression algorithms	T1:167-193
20	**Design** Lossy compression algorithms	Lossy compression algorithms	T1:199-247
21	**Learn** Image compression standards	Image compression standards	T1:253-282
22	**Discuss** Basic Video compression techniques	Basic Video compression techniques	T1:288-307
23	**Analyze the** Case study :MPEG Video Coding I	Case study :MPEG Video Coding I	T1:312-329
24	**Discuss** various types of basic Audio compression techniques.	Basic Audio compression techniques	T1:374-389
25	**Understand** Case study: MPEG Audio compression	Case study: MPEG Audio compression	T1:395-415

26	**Understand** Web 2.0,What is web 2.0	Web 2.0,What is web 2.0	T3:114-118
27	**Understand** Search, Content Networks	Search, Content Networks	T3: 120-132
28	**Understand** User Generated Content	User Generated Content	T3: 134-137
29	**Understand** Blogging	Blogging	T3: 137-142
30	**Discuss** Social Networking, Social Media	Social Networking, Social Media	T3: 109-112
31	**Discuss** Tagging, Social Marking	Tagging, Social Marking	T3:145-147
32	**Discuss** Rich Internet Applications	Rich Internet Applications	T3:148-149
33	**Understand** Web Services, Mashups	Web Services, Mashups	T3:151-155
34	**Discuss** Location Based Services	Location Based Services	T3:156-157
35	**Discuss** XML, RSS, Atom, JSON and VolP	XML, RSS, Atom, JSON and VolP	T3:161-165
36	**Understand** Web 2.0 Monetization and Business Models	Web 2.0 Monetization and Business Models	T3:165-167
37	**Analysis** the Future of the Web.	Future of the Web.	T3:170-173
38	**Learn** Adobe Flash Introduction, Flash Movie Development	Adobe Flash Introduction, Flash Movie Development	T3:175-177
39	**Learn** Flash with Hands-on Examples	Learning Flash with Hands-on Examples	T3:177-178
40	**Understand how to** Publish your flash movie, Creating special effects with Flash**.**	Publish your flash movie, Creating special effects with Flash	T3:179-180
41	**Discuss** Creating a website splash screen	Creating a website splash screen	T3:180-182
42	**Discuss** action script, web sources	action script, web sources	T3:183-186
43-45	**Discuss** Rich Internet Applications(RIAs) with Flex 3 – Introduction	Rich Internet Applications(RIAs) with Flex 3 – Introduction	T3:186-189
46-47	**Discuss** how to Developing with Flex 3	Developing with Flex 3	T3:190-195
48-50	**Discuss** how the Working with Components	Working with Components	T3:195-197
51-53	**Discuss** on Advanced Component Development	Advanced Component Development	T3:198-201
54-56	**Discuss** on Visual Effects and Multimedia	Visual Effects and Multimedia	T3:205-207
57	**Understand** Ajax- Enabled Rich Internet Application	Ajax- Enabled Rich Internet Application : Introduction	T3:207-109

58	**Discuss** on Traditional Web Applications Vs Ajax Applications	Traditional Web Applications Vs Ajax Applications	T3:210-215
59	**Discuss** Rich Internet Application with Ajax.	Rich Internet Application with Ajax	T3:215-217
60-61	**Discuss** on the History of Ajax, Raw Ajax example using xmlhttprequest object	History of Ajax, Raw Ajax example using xmlhttprequest object	T3:219-220
62	**Analyze** how to Using XML	Using XML	T3:222-225
63-64	**Learn** how to Creating a full scale Ajax Enabled application	Creating a full scale Ajax Enabled application	T3:225-228
65	**Discuss** Dojo ToolKit	Dojo ToolKit	T3:228-230

XI   MAPPING COURSE OBJECTIVES LEADING TO THE ACHIEVEMENT OF PROGRAM   OUTCOMES:

Course Objectives	Program Outcomes													Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1						S			H					S		S
2			S											H		
3							S				S				S	
4															H	
5	H	S										S		S		

S= Supportive   H = Highly Related

XII   MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES:

Course Outcomes	Program Outcomes													Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1								S								
2		S									S		H	S		
3			H								H	S				
4	H								S							S
5									S					S		
6								S								

7		S							S		H	S		
8			H						H	S				
9	H							S						S
10								S				S		

S= Supportive   H = Highly Related

Prepared by: B. Dhanalaxmi, Associate Professor, IT

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