Tamkang University Academic Year 102, 1st Semester Course Syllabus

Course Title	MULTIMEDIA COMMUNICATION SYSTEMS	Instructor	LIN IN-HO
Course Class	TPIAB3A DIVISION OF SOFTWARE ENGINEERING, DEPARTMENT OF INNOVATIVE INFORMATION AND TECHNOLOGY, 3A	Details	◆ Selective ◆ One Semester ◆ 3 Credits

Departmental teaching objectives

Cultivate professional talents in software engineering and communication technology.

Departmental core competences

A. Capability of computer program coding, process planning, and problem solving.

B. Capability of applying basic mathematics and information technology related mathematics.

C. Capability of applying knowledge of internet structure and protocol in communication system.

D. Capability of data collecting and analyzing, and organizing software and hardware.

E. Capability of understanding and integrating system structure for problem solving.

F. Capability of system analyzing, modeling, and designing.

G. Capability of management utilizing information technology system.

Course Introduction	The purpose of this course is to introduce some of the notions included in the term multimedia and aim the student to look at the most important data representations for multimedia applications, examining image data, video data, and audio data in detail. We also introduce data compression techniques that turns to be an important enabling technology that makes modern multimedia systems possible and also look at lossless and lossy compression methods. The standard of image and video encoding as well as the multimedia communication systems will also be introduced.

The Relevance among Teaching Objectives, Objective Levels and Departmental core competences

I.Objective Levels (select applicable ones) :
 (i) Cognitive Domain   : C1-Remembering,   C2-Understanding,   C3-Applying,
                          C4-Analyzing,   C5-Evaluating,   C6-Creating
 (ii) Psychomotor Domain : P1-Imitation,   P2-Mechanism,   P3-Independent Operation,
                          P4-Linked Operation, P5-Automation,   P6-Origination
 (iii) Affective Domain : A1-Receiving,   A2-Responding,   A3-Valuing,
                          A4-Organizing,   A5-Charaterizing,   A6-Implementing

II.The Relevance among Teaching Objectives, Objective Levels and Departmental core competences :
 (i) Determine the objective level(s) in any one of the three learning domains (cognitive,
     psychomotor, and affective) corresponding to the teaching objective. Each objective should
     correspond to the objective level(s) of ONLY ONE of the three domains.
 (ii) If more than one objective levels are applicable for each learning domain, select the
     highest one only. (For example, if the objective levels for Cognitive Domain include
     C3,C5,and C6, select C6 only and fill it in the boxes below. The same rule applies to
     Psychomotor Domain and Affective Domain.)
 (iii) Determine the Departmental core competences that correspond to each teaching objective.
     Each objective may correspond to one or more Departmental core competences at a time.
     (For example, if one objective corresponds to three Departmental core competences: A,AD,
     and BEF, list all of the three in the box.)

| No. | Teaching Objectives | Relevance | |
		Objective Levels	Departmental core competences
1	Learn the data representation of multimedia elements, examining text, image data, video data, and audio data in detail.	C2	BC
2	Students will be able to learn and discover the digital representation of various multimedia elements and their related compression technique.	P3	BCF
3	To know the fundamentals of the major topics of the multimedia communication systems: audio-visual integration, multimedia processing in communications, distributed multimedia systems, multimedia communication standards and multimedia communications across networks.	P3	BCEF
4	Through the teamwork project research, to study and learn the integration of theoretical knowledge and practical expertise on the applications of innovative multimedia information and communication system technologies	A6	ABCEFG

Teaching Objectives, Teaching Methods and Assessment

No.	Teaching Objectives	Teaching Methods	Assessment
1	Learn the data representation of multimedia elements, examining text, image data, video data, and audio data in detail.	Lecture, Discussion, Simulation	Participation, Quiz

2	Students will be able to learn and discover the digital representation of various multimedia elements and their related compression technique.	Lecture, Discussion, Problem solving	Written test, Report, Participation
3	To know the fundamentals of the major topics of the multimedia communication systems: audio-visual integration, multimedia processing in communications, distributed multimedia systems, multimedia communication standards and multimedia communications across networks.	Lecture, Discussion, Practicum	Written test, Report, Participation
4	Through the teamwork project research, to study and learn the integration of theoretical knowledge and practical expertise on the applications of innovative multimedia information and communication system technologies	Lecture, Discussion, Practicum, Problem solving	Report, Participation

This course has been designed to cultivate the following essential qualities in TKU students

Essential Qualities of TKU Students	Description
◇ A global perspective	Helping students develop a broader perspective from which to understand international affairs and global development.
◆ Information literacy	Becoming adept at using information technology and learning the proper way to process information.
◇ A vision for the future	Understanding self-growth, social change, and technological development so as to gain the skills necessary to bring about one's future vision.
◇ Moral integrity	Learning how to interact with others, practicing empathy and caring for others, and constructing moral principles with which to solve ethical problems.
◆ Independent thinking	Encouraging students to keenly observe and seek out the source of their problems, and to think logically and critically.
◇ A cheerful attitude and healthy lifestyle	Raising an awareness of the fine balance between one's body and soul and the environment; helping students live a meaningful life.
◆ A spirit of teamwork and dedication	Improving one's ability to communicate and cooperate so as to integrate resources, collaborate with others, and solve problems.
◇ A sense of aesthetic appreciation	Equipping students with the ability to sense and appreciate aesthetic beauty, to express themselves clearly, and to enjoy the creative process.

Course Schedule

Week	Date	Subject/Topics	Note

1	102/09/16~ 102/09/22	Introduction to Multimedia Communications (Halsall, Ch.1)	
2	102/09/23~ 102/09/29	Multimedia Information Representation (1) :Text, Images (Halsall, Ch.2)	Digitization Principles
3	102/09/30~ 102/10/06	1、 Multimedia Information Representation (1) : , Audio (Halsall, Ch.2)	
4	102/10/07~ 102/10/13	Fundamental Concepts in Video (Li, Ch. 5)	
5	102/10/14~ 102/10/20	Basics of Digital Audio (Li, Ch. 6)	
6	102/10/21~ 102/10/27	Lossless Compression Algorithm (Li, Ch. 7)	
7	102/10/28~ 102/11/03	Lossy Compression Algorithm (Li, Ch. 8)	
8	102/11/04~ 102/11/10	Image Compression Standards (Li, Ch. 9)	
9	102/11/11~ 102/11/17	Basic Video Compression Techniques (Li, Ch.10)	
10	102/11/18~ 102/11/24	Midterm Exam Week	
11	102/11/25~ 102/12/01	MPEG Video Coding (Li Ch.11)	
12	102/12/02~ 102/12/08	Computer and Multimedia Networks I (Li, Ch. 15)	Field Trip
13	102/12/09~ 102/12/15	Computer and Multimedia Networks II (Li, Ch. 15)	
14	102/12/16~ 102/12/22	Transport Protocols (Halsall, Ch. 12)	
15	102/12/23~ 102/12/29	Multimedia Network Communications and Applications I (Li, Ch. 16)	
16	102/12/30~ 103/01/05	Multimedia Network Communications and Applications II (Li, Ch. 16):The Internet, Broadband ATM Networks	
17	103/01/06~ 103/01/12	Wireless Networks (Li, Ch. 17)	
18	103/01/13~ 103/01/19	Final Exam Week	

Requirement	每2~3位同學組成一個小組團隊，並自選一個堆媒體相關專案進行實作及研究，期末時，完成並作簡報。
Teaching Facility	Computer, Projector
Textbook(s)	Fundamentals of Multimedia　Ze-Nian Li.Mark　開發圖書有限公司 Multimedia Communications, Applications, Networks, Protocols and standards by Fred Halsall

Reference(s)	Multimedia Communications Fred Halsall 新月圖書公司
	Introduction to Multimedia Communications: Applications, Middleware, Networking K.R. Rao, Zoran S. 全華圖書
	H.264 and MPEG-4 Video Compression by Iain E.G. Richardson Willy 2003
	Video Communication and Compressions 2nd Ed. by Lajos Hanzo, Peter Cherriman, Willy 2007
	多媒體通訊 戴顯權 滄海圖書
Number of Assignment(s)	**2** (Filled in by assignment instructor only)
Grading Policy	◆ Attendance： 10.0 % ◆ Mark of Usual：20.0 % ◆ Midterm Exam： 25.0 % ◆ Final Exam： 25.0 % ◆ Other〈專案報告〉：20.0 %
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at http://info.ais.tku.edu.tw/csp or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at http://www.acad.tku.edu.tw/CS/main.php . **※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.**