Tamkang University Academic Year 114, 1st Semester Course Syllabus

Course Title	DIGITAL IMAGE PROCESSING	Instructor	MENG-LUEN WU
Course Class	TEIBM1A MASTER'S PROGRAM, DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING (ENGLISH-TAUGHT PROGRAM), 1A	Details	◆ General Course ◆ Selective ◆ One Semester ◆ 3 Credits
Relevance to SDGs	SDG8 Decent work and economic growth SDG9 Industry, Innovation, and Infrastructure SDG17 Partnerships for the goals		

Departmental Aim of Education

Ⅰ. Cultivate the ability to conduct independent research and problem solving.

Ⅱ. Strengthen creativity and research capacity.

Ⅲ. Build profound professional knowledge in computer science and information engineering.

Ⅳ. Engage in self-directed lifelong learning.

Subject Departmental core competences

A. Independent problem solving ability.(ratio:20.00)

B. Independent innovative thinking ability.(ratio:20.00)

C. Research paper writing and presentation ability.(ratio:20.00)

D. Research & development (R&D) ability in information engineering.(ratio:20.00)

E. Project execution and control ability.(ratio:10.00)

F. Lifelong self-directed learning ability.(ratio:10.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:10.00)

2. Information literacy. (ratio:20.00)

3. A vision for the future. (ratio:10.00)

4. Moral integrity. (ratio:10.00)

5. Independent thinking. (ratio:20.00)

6. A cheerful attitude and healthy lifestyle. (ratio:10.00)

7. A spirit of teamwork and dedication. (ratio:10.00)

8. A sense of aesthetic appreciation. (ratio:10.00)

Course Introduction	Overview of digital image processing including visual perception, image formation, spatial transformations, image enhancement, color image representation and processing, edge detection, image segmentation, and morphological image processing.

The correspondences between the course's instructional objectives and the cognitive, affective, and psychomotor objectives.

Differentiate the various objective methods among the cognitive, affective and psychomotor domains of the course's instructional objectives.

I. Cognitive : Emphasis upon the study of various kinds of knowledge in the cognition of the course's veracity, conception, procedures, outcomes, etc.
II.Affective : Emphasis upon the study of various kinds of knowledge in the course's appeal, morals, attitude, conviction, values, etc.
III.Psychomotor: Emphasis upon the study of the course's physical activity and technical manipulation.

No.	Teaching Objectives	objective methods
1	1. Human visual systems and color space model 2. Image enhancement techniques 3. Image histogram analysis 4. Image restoration 5. Image segmentation 6. Morphological operations 7. Frequency domain manipulation 8. Image compression methods	Cognitive

The correspondences of teaching objectives : core competences, essential virtues, teaching methods, and assessment

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCDEF	12345678	Lecture, Discussion, Experience	Testing, Discussion(including classroom and online), Report(including oral and written)

Course Schedule

Week	Date	Course Contents	Note
1	114/09/15 ~ 114/09/21	Overview, Computer imaging systems	

2	114/09/22 ~ 114/09/28	Image preprocessing	
3	114/09/29 ~ 114/10/05	Human visual system	
4	114/10/06 ~ 114/10/12	Image binarization and histogram	
5	114/10/13 ~ 114/10/19	Image enhancement	
6	114/10/20 ~ 114/10/26	Image restoration	
7	114/10/27 ~ 114/11/02	Morphological operations	
8	114/11/03 ~ 114/11/09	Connected components and shapes	
9	114/11/10 ~ 114/11/16	Presentation I	
10	114/11/17 ~ 114/11/23	Midterm Week	
11	114/11/24 ~ 114/11/30	Image segmentation methods	
12	114/12/01 ~ 114/12/07	Fourier discrete transformations	
13	114/12/08 ~ 114/12/14	Frequency filters, geometric transforms	
14	114/12/15 ~ 114/12/21	Wavelets transform	
15	114/12/22 ~ 114/12/28	Image compression, lossless & lossy method	
16	114/12/29 ~ 115/01/04	Image Processing Technique Trends	
17	115/01/05 ~ 115/01/11	Presentation II	
18	115/01/12 ~ 115/01/18	Final Exam	

Key capabilities	
Interdisciplinary	
Distinctive teaching	

Course Content	Computer programming or Computer language (students have hands-on experience in related projects)
Requirement	
Textbooks and Teaching Materials	Self-made teaching materials:Presentations Using teaching materials from other writers:Textbooks
References	
Grading Policy	◆ Attendance： 10.0 % ◆ Mark of Usual： % ◆ Midterm Exam： 15.0 % ◆ Final Exam： 15.0 % ◆ Other〈Base Score〉：60.0 %
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at https://web2.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. ※"Adhere to the concept of intellectual property rights" and "Do not illegally photocopy, download, or distribute." Using original textbooks is advised. It is a crime to improperly photocopy others' publications.