Course Title	COMPUTER VISION	Instructor	MENG-LUEN WU
Course Class	TEIBM1A MASTER'S PROGRAM, DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING (ENGLISH-TAUGHT PROGRAM),	Details	◆ General Course ◆ Selective ◆ One Semester

Relevance to SDGs	1A
	  SDG4 Quality education
	
	  SDG9 Industry, Innovation, and Infrastructure

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:10.00)

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

E. Project execution and control ability.(ratio:20.00)

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

Subject Schoolwide essential virtues

2. Information literacy. (ratio:30.00)

4. Moral integrity. (ratio:10.00)

5. Independent thinking. (ratio:20.00)

7. A spirit of teamwork and dedication. (ratio:20.00)

8. A sense of aesthetic appreciation. (ratio:20.00)

	Course Introduction	This course is a broad introduction to computer vision. Topics include camera models, multi-view geometry, reconstruction, some low-level image processing, and high-level vision tasks like image classification and object detection. There are two parts in this course. The first part is about object detection, tracking, and recognition; the second part focus on multiple image processing and 3-D model reconstruction.

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	Image color models	Cognitive
2	Image shapes	Cognitive
3	Image segmentation	Cognitive
4	Object detection	Cognitive
5	Object tracking	Cognitive
6	Object recognition	Cognitive
7	Camera models	Cognitive
8	Stereopsis	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABD	2	Lecture, Discussion, Publication, Practicum	Discussion(including classroom and online), Practicum
2	ABD	245	Lecture, Discussion, Publication, Practicum	Testing, Study Assignments, Discussion(including classroom and online)

3	ABD	245	Lecture, Discussion, Publication, Practicum	Testing, Study Assignments, Discussion(including classroom and online)
4	ABD	24	Lecture, Discussion, Publication, Practicum	Testing, Study Assignments, Discussion(including classroom and online), Practicum
5	ABD	24	Lecture, Discussion, Publication, Practicum	Testing, Study Assignments, Discussion(including classroom and online)
6	ABCDEF	24578	Lecture, Discussion, Publication, Practicum	Testing, Study Assignments, Discussion(including classroom and online), Practicum
7	ABD	245	Lecture, Discussion, Publication, Practicum	Testing, Study Assignments, Discussion(including classroom and online), Practicum
8	ABD	245	Lecture, Discussion, Publication, Practicum	Testing, Study Assignments

Course Schedule

Week	Date	Course Contents	Note
1	111/02/21 ~ 111/02/25	Introduction to computer vision	
2	111/02/28 ~ 111/03/04	Image color models	
3	111/03/07 ~ 111/03/11	Image shapes and connected components	
4	111/03/14 ~ 111/03/18	Image segmentation methods	
5	111/03/21 ~ 111/03/25	Object detection in image using traditional method	
6	111/03/28 ~ 111/04/01	Object detection in image using end-to-end model	
7	111/04/04 ~ 111/04/08	Teaching administration observation period	
8	111/04/11 ~ 111/04/15	Object tracking	
9	111/04/18 ~ 111/04/22	Object recognition using traditional method	
10	111/04/25 ~ 111/04/29	Object recognition using deep learning method	
11	111/05/02 ~ 111/05/06	Midterm	
12	111/05/09 ~ 111/05/13	Image stitching	

13	111/05/16 ~ 111/05/20	Camera models and rectification	
14	111/05/23 ~ 111/05/27	Stereo vision and Stereopsis	
15	111/05/30 ~ 111/06/03	Multi-view cameras	
16	111/06/06 ~ 111/06/10	Object reconstruction	
17	111/06/13 ~ 111/06/17	Presentation	
18	111/06/20 ~ 111/06/24	Final Exam	

Requirement	
Teaching Facility	Computer, Projector
Textbooks and Teaching Materials	Szeliski, Richard. Computer vision: algorithms and applications. Springer Science & Business Media, 2010.
References	
Number of Assignment(s)	(Filled in by assignment instructor only)
Grading Policy	◆ Attendance： 10.0 ％ ◆ Mark of Usual： ％ ◆ Midterm Exam： 30.0 ％ ◆ Final Exam： 30.0 ％ ◆ Other〈Presentation〉：30.0 ％
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.**