Tamkang University Academic Year 113, 2nd Semester Course Syllabus

Course Title	INDUSTRIAL BIG DATA	Instructor	CHUAN LI
Course Class	TEXBM1A INTERNATIONAL INTENSE MASTER'S PROGRAM IN AI INTELLIGENT MACHINERY AND SUSTAINABLE MANUFACTURING, COLLEGE OF ENGINEERING (ENGLISH-TAUGHT PRO, 1A	Details	◆ General Course ◆ Selective ◆ One Semester ◆ 3 Credits
Relevance to SDGs	SDG6 Clean water and sanitation SDG7 Affordable and clean energy SDG8 Decent work and economic growth SDG9 Industry, Innovation, and Infrastructure		

Departmental Aim of Education

Ⅰ. Educating students to possess the ability to apply AI in the field of intelligent machinery and manufacturing, while also fostering the capability to implement sustainable development goals.

Ⅱ. Training students to possess independent research and problem-solving skills, and to adhere to engineering ethics as professional engineers.

Ⅲ. Cultivating students' ability to discern international technology trends and engage in global communication and cooperation.

Ⅳ. Developing students' abilities for lifelong learning and staying current with the times.

Subject Departmental core competences

A. AI Technology Application and Innovation Capabilities.(ratio:40.00)

B. Intelligent Machinery and Manufacturing R&D Capabilities.(ratio:20.00)

C. Independent Research and Problem-Solving Skills.(ratio:20.00)

D. Sustainable Development Goals Implementation Skills.(ratio:5.00)

E. International Communication and Cooperation Skills.(ratio:10.00)

F. Proactive Lifelong Learning Skills.(ratio:5.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:10.00)

2. Information literacy. (ratio:30.00)

3. A vision for the future. (ratio:5.00)

4. Moral integrity. (ratio:10.00)

5. Independent thinking. (ratio:30.00)

6. A cheerful attitude and healthy lifestyle. (ratio:5.00)

7. A spirit of teamwork and dedication. (ratio:5.00)

8. A sense of aesthetic appreciation. (ratio:5.00)

Course Introduction	In this course, we, therefore, shall focus on five categories of techniques that are frequently used in industrial big data analytics: (1) data visualization, (2) data distribution, (3) data estimates, (4) data inference, (5) data analytics.

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	To help students understand the bid data analytics.	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, Practicum	Testing, Study Assignments, Report(including oral and written)

Course Schedule

Week	Date	Course Contents	Note
1	114/02/17 ~ 114/02/23	Basics of Probability	
2	114/02/24 ~ 114/03/02	Discrete Random Variables and Probability Distributions	
3	114/03/03 ~ 114/03/09	Discrete Random Variables and Probability Distributions	

4	114/03/10 ~ 114/03/16	Continuous Random Variables and Probability Distributions	
5	114/03/17 ~ 114/03/23	Continuous Random Variables and Probability Distributions	
6	114/03/24 ~ 114/03/30	Joint Probability Distributions	
7	114/03/31 ~ 114/04/06	Point Estimation of Parameters and Sampling Distributio	
8	114/04/07 ~ 114/04/13	Statistical Inference for a Single Sample	
9	114/04/14 ~ 114/04/20	Statistical Inference for a Single Sample	
10	114/04/21 ~ 114/04/27	Simple Linear Regression and Correlation	
11	114/04/28 ~ 114/05/04	Probabilistic Data mining	
12	114/05/05 ~ 114/05/11	Probabilistic Data mining	
13	114/05/12 ~ 114/05/18	Probabilistic Data mining	
14	114/05/19 ~ 114/05/25	Graphical Probability Theory	
15	114/05/26 ~ 114/06/01	Graphical Probability Theory	
16	114/06/02 ~ 114/06/08	Probability of Learning	
17	114/06/09 ~ 114/06/15	Probability of Learning	
18	114/06/16 ~ 114/06/22	Final	

Key capabilities	self-directed learning International mobility Information Technology Interdisciplinary
Interdisciplinary	STEAM course (S:Science, T:Technology, E:Engineering, M:Math, A field:Integration of Art and Humanist)
Distinctive teaching	Industry-university collaboration courses Project implementation course Translation Teaching Course Learning technologies (such as AR/VR,etc.) incorporated to physical courses

Course Content	Computer programming or Computer language (students have hands-on experience in related projects) Intellectual Property (learning intellectual property) Logical Thinking Environmental Safety Green Energy AI application Sustainability issue
Requirement	No late homework
Textbooks and Teaching Materials	Self-made teaching materials:Textbooks Name of teaching materials: Engineering Statistics / Edition 5 by Douglas C. Montgomery, George C. Runger, Norma F. Hubele EDITION: 5th Edition ISBN: 0470631473 ISBN-13: 9780470631478e Using teaching materials from other writers:Presentations
References	
Grading Policy	◆ Attendance： 5.0 % ◆ Mark of Usual：20.0 % ◆ Midterm Exam： 25.0 % ◆ Final Exam： 40.0 % ◆ Other〈proejct〉：10.0 %
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.**