

Tamkang University Academic Year 113, 2nd Semester Course Syllabus

Course Title	PRACTICAL DATA SCIENCE ON PYTHON	Instructor	HO THI TRANG
Course Class	TEIBM1A MASTER'S PROGRAM, DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING (ENGLISH-TAUGHT PROGRAM),	Details	◆ General Course ◆ Selective ◆ One Semester ◆ 3 Credits
Relevance to SDGs	1A SDG5 Gender equality SDG9 Industry, Innovation, and Infrastructure		
D e p a r t m e n t a l A i m o f E d u c a t i o n			
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			
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:10.00) 6. A cheerful attitude and healthy lifestyle. (ratio:10.00) 7. A spirit of teamwork and dedication. (ratio:20.00) 8. A sense of aesthetic appreciation. (ratio:10.00)			

Course Introduction	The course will introduce practice of data science using the popular python pandas data science library and introduce the abstraction of the Series and DataFrame as the central data structures for data analysis, along with tutorials on the process of a typical data science project, including: defining project goals,collecting, preparing, managing and visualizing data, building models, evaluating the models and results.
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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	Data Manipulation and Cleaning Techniques using the Popular Python Pandas Data Science Library	Cognitive
2	Explore Different Approaches for Creating Predictive Models on Data using Machine Learning	Cognitive
3	Text Mining and Text Manipulation Basics	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABE	1234578	Lecture, Discussion, Practicum	Testing, Study Assignments, Discussion(including classroom and online)
2	ABCDEF	1245678	Lecture, Discussion, Practicum	Testing, Study Assignments, Discussion(including classroom and online)
3	ADEF	12456	Lecture, Publication, Practicum	Testing, Study Assignments, Discussion(including classroom and online)

Course Schedule			
Week	Date	Course Contents	Note
1	114/02/17 ~ 114/02/23	Course Introduction, Introduction to Data Science	
2	114/02/24 ~ 114/03/02	Fundamentals of Data Manipulation with Python(1)	
3	114/03/03 ~ 114/03/09	Fundamentals of Data Manipulation with Python(2)	
4	114/03/10 ~ 114/03/16	Basic Data Processing with Pandas	
5	114/03/17 ~ 114/03/23	Basic Charting	
6	114/03/24 ~ 114/03/30	Charting Fundamentals, Applied Visualizations (1)	
7	114/03/31 ~ 114/04/06	Charting Fundamentals, Applied Visualizations (2)	
8	114/04/07 ~ 114/04/13	Fundamentals of Machine Learning, Introduce to Scikit Learn (1)	
9	114/04/14 ~ 114/04/20	Fundamentals of Machine Learning, Introduce to Scikit Learn(2)	
10	114/04/21 ~ 114/04/27	Midterm exam week	Presentation
11	114/04/28 ~ 114/05/04	Supervised Machine Learning (1)	
12	114/05/05 ~ 114/05/11	Supervised Machine Learning (2)	
13	114/05/12 ~ 114/05/18	Supervised Machine Learning (3)	
14	114/05/19 ~ 114/05/25	Evaluation(1)	
15	114/05/26 ~ 114/06/01	Evaluation(2)	
16	114/06/02 ~ 114/06/08	Final Presentation	
17	114/06/09 ~ 114/06/15	Final Presentation	
18	114/06/16 ~ 114/06/22	Final exam week	
Key capabilities		Information Technology	
Interdisciplinary		STEAM course (S:Science, T:Technology, E:Engineering, M:Math, A field:Integration of Art and Humanist)	

Distinctive teaching	
Course Content	Computer programming or Computer language (students have hands-on experience in related projects) Gender Equality Education AI application
Requirement	
Textbooks and Teaching Materials	Self-made teaching materials:Presentations, Handouts Using teaching materials from other writers:Textbooks Name of teaching materials: Wes McKinney, "Python for Data Analysis." , ISBN: 978-1-449-31979-3, O' REILLY.
References	
Grading Policy	<p>◆ Attendance : 10.0 % ◆ Mark of Usual : % ◆ Midterm Exam : 30.0 %</p> <p>◆ Final Exam : 40.0 %</p> <p>◆ Other 〈Assignment〉 : 20.0 %</p>
Note	<p>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 .</p> <p>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</p>