

Tamkang University Academic Year 111, 1st Semester Course Syllabus

Course Title	PRACTICAL DATA SCIENCE ON PYTHON	Instructor	HO THI TRANG
Course Class	TEIDB3P DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING (ENGLISH-TAUGHT PROGRAM), 3P	Details	<ul style="list-style-type: none"> ◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	SDG4 Quality education		
Departmental Aim of Education			
<ul style="list-style-type: none"> I. Comprehend professional knowledge. II. Acquire mastery of Practical Skills. III. Establish creative achievement. 			
Subject Departmental core competences			
<ul style="list-style-type: none"> A. Programming and application ability.(ratio:40.00) B. Mathematical reasoning ability.(ratio:10.00) C. Implementing computer systems ability.(ratio:20.00) D. Computer networking application skills.(ratio:10.00) E. Professional skills for information technology (IT) industry.(ratio:20.00) 			
Subject Schoolwide essential virtues			
<ul style="list-style-type: none"> 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	ABCE	123578	Lecture, Discussion, Practicum	Study Assignments, Discussion(including classroom and online)
2	ABCDE	1235678	Lecture, Practicum	Study Assignments, Discussion(including classroom and online)
3	ABCD	245	Lecture, Discussion, Practicum	Discussion(including classroom and online), Practicum

Course Schedule

Week	Date	Course Contents	Note

1	111/09/05 ~ 111/09/11	Course Introduction, Introduction to Data Science	
2	111/09/12 ~ 111/09/18	Fundamentals of Data Manipulation with Python	
3	111/09/19 ~ 111/09/25	Basic Data Processing with Pandas	
4	111/09/26 ~ 111/10/02	Basic Charting	
5	111/10/03 ~ 111/10/09	Charting Fundamentals, Applied Visualizations (I)	
6	111/10/10 ~ 111/10/16	Charting Fundamentals, Applied Visualizations (II)	Assignment 1
7	111/10/17 ~ 111/10/23	Fundamentals of Machine Learning, Introduce to Scikit Learn	
8	111/10/24 ~ 111/10/30	Supervised Machine Learning (I)	
9	111/10/31 ~ 111/11/06	Evaluation	
10	111/11/07 ~ 111/11/13	Midterm Exam Week	
11	111/11/14 ~ 111/11/20	Supervised Machine Learning (II)	
12	111/11/21 ~ 111/11/27	Working with Text in Python	
13	111/11/28 ~ 111/12/04	Basic Natural Language Processing	
14	111/12/05 ~ 111/12/11	Classification of Text	Assignment 2
15	111/12/12 ~ 111/12/18	Neural Network and Deep Learning	
16	111/12/19 ~ 111/12/25	Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning	
17	111/12/26 ~ 112/01/01	Sequences, Time Series and Prediction using TensorFlow	
18	112/01/02 ~ 112/01/08	Final Exam Week	
Requirement			
Teaching Facility		Computer, Projector	
Textbooks and Teaching Materials		Wes McKinney, "Python for Data Analysis." , ISBN: 978-1-449-31979-3, O' REILLY. Jake VanderPlas, "Python Data Science Handbook", O' REILLY.	
References			

Number of Assignment(s)	2 (Filled in by assignment instructor only)
Grading Policy	◆ Attendance : 10.0 % ◆ Mark of Usual : % ◆ Midterm Exam : 30.0 % ◆ Final Exam : 40.0 % ◆ Other (Assignment) : 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.