

National Taiwan Normal University Online Course Teaching Plan

Instructions: According to **Article 6 of the Implementation Regulations Regarding Distance Learning by Universities**, Departments/Programs offering distance learning courses, shall present a course plan and submit it for approval by the university-level academic affairs committee. The course plan referred to in the preceding paragraph shall set forth learning objectives, the target student group, a course outline, teaching methods, interactive student-teacher discussion, grading and course requirements. The course plan shall be posted on the Internet.

1. **Chinese Course Name:** __智慧城市中的資料科學與通訊__
2. **English Course Name:** __Data Science and Communication in Smart Cities__
3. **Course start date:** Summer (Fall, Spring, or Summer) semester of 2024 (yyyy)
4. **Course review submission record**(if applicable):
 - (1) It is a new online course or an existing face-to-face course switching to online course in this semester
 - (2) It is an existing online course; the latest University's Course Committee approval was in the Spring semester of 2023 (academic year)
 - (2.1) The 5-year validity period has expired; a new application is required.
 - (2.2) In case of a major change in the original approved course or if the revision ratio exceeds 30%, reapplication is required.

5. Basic Course Information (if applicable)

(1)	Instructor Name & Title	Chao Wang (Assistant Professor) from NTNU, and Shin'ichi Konomi (Professor) from Kyushu University
(2)	Instructor Sources	<input checked="" type="checkbox"/> Appointed by Departments <input type="checkbox"/> Appointed by General Education Center <input type="checkbox"/> Both of Above <input type="checkbox"/> Others:
(3)	College/Department/Center	Department of Computer Science and Information Engineering
(4)	School System	<input checked="" type="checkbox"/> Undergraduate Program <input type="checkbox"/> Master's Program <input type="checkbox"/> BA/MA Joint Course <input type="checkbox"/> MA/PhD Joint Course <input type="checkbox"/> PhD Program <input type="checkbox"/> Continuing Education Master's Program
(5)	Program Type	<input checked="" type="checkbox"/> Full-time Program <input type="checkbox"/> Part-time Program <input type="checkbox"/> Others:
(6)	Course Type	<input type="checkbox"/> Common Courses <input type="checkbox"/> General Courses <input type="checkbox"/> School Required Courses <input checked="" type="checkbox"/> Professional Courses <input type="checkbox"/> Educational Courses <input type="checkbox"/> Other:
(7)	Required Courses	<input type="checkbox"/> University-required <input type="checkbox"/> College-required <input type="checkbox"/> Graduate Institute-required <input type="checkbox"/> Department-required <input checked="" type="checkbox"/> Others: elective
(8)	Course Duration	<input type="checkbox"/> One Semester (half year) <input type="checkbox"/> Two Semesters (one year) <input checked="" type="checkbox"/> Others: summer, intensive (16 hours)
(9)	Required/Elective Course	<input type="checkbox"/> Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/> Others:
(10)	Course Credits	1

(11)	Average of Face-to-Face Teaching Hours Per Week	_3.2_ hour(s)/week (Divide the total "face-to-face teaching" hours, including the hours of face-to-face teaching and synchronous teaching, by the total number of course weeks.)
(12)	Number of Classes	1
(13)	Estimated Total Number of Students	30 (15 from NTNU and 15 from Kyushu University)
(14)	EMI Courses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
(15)	Type of Cooperation with Domestic/Foreign Universities (omit if inapplicable)	1. Cooperative University: <u>Kyushu University</u> ; Department/Institute: <u>School of Interdisciplinary Science and Innovation</u> ; Instructor Name: <u>Shin'ichi Konomi</u> ; Course Name: <u>Data Science and Communication in Smart Cities</u> ; Number of Students: <u>15</u> 2. <input checked="" type="checkbox"/> Partner University <input type="checkbox"/> Dual-Degree Program <input checked="" type="checkbox"/> Global Virtual Classroom Course <input type="checkbox"/> Others: _____
(16)	Course Platform Website (asynchronous teaching is required)	NTNU online learning platform: https://moodle.ntnu.edu.tw/
(17)	Syllabus Website	http://courseap.itc.ntnu.edu.tw/acadmOpenCourse/index.jsp

6. Course Teaching Design and Implementation Method

(1)	Course Goals	Acquire problem-solving education in data science and data communication, gain hands-on experiences in the subject matter, and be able to discuss complex social issues in smart cities and to propose solutions to them.				
(2)	Target Student Group	Undergraduate students who are familiar with basic computational thinking and computer programming.				
(3)	Prerequisite(s)	Passed computer programming course or at least one common education course in computational thinking				
(4)	Course Content Outline: The followings take 16 weeks per semester for example:					
	Face-to-Face Teaching		Distance learning			
			Synchronous	Asynchronous		
	at least 2 weeks		at least 3 weeks	at least 8 weeks		
Note: If the online course is offered with cooperative universities, it is not subject to the above teaching hours allocation.						
	Day	Topics (If there are multiple instructors, please specify instructor names in each week)	Learning Objectives (From the perspective of students)	Teaching Interactive Design (Multiple choices allowed)	Testing/Evaluation Activities (Multiple choices allowed. Choose	Teaching Method and Hours (fill-in the number of hours, omit if none)
					Face-to-	Distance learning

				“None” if not designed for the week.)	Face Teaching	Synchro nous	Asynchr onous
1	Course Overview	1. Students will learn the basic concepts of smart cities and their related complex social issues.	<input checked="" type="checkbox"/> Topic discussion <input checked="" type="checkbox"/> Group discussion <input type="checkbox"/> Peer review <input checked="" type="checkbox"/> Instructor feedback <input type="checkbox"/> Others: _____	<input type="checkbox"/> Tests <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> _____ exam <input type="checkbox"/> _____ report <input type="checkbox"/> Others: _____ <input type="checkbox"/> None		3	
2	Data Science Basics	1. Students will acquire fundamental knowledge in data science. 2. Students can use software tools to interpret and analyze data.	<input checked="" type="checkbox"/> Topic discussion <input checked="" type="checkbox"/> Group discussion <input type="checkbox"/> Peer review <input checked="" type="checkbox"/> Instructor feedback <input type="checkbox"/> Others: _____	<input type="checkbox"/> Tests <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> _____ exam <input type="checkbox"/> _____ report <input type="checkbox"/> Others: _____ <input type="checkbox"/> None		3	
3	Data Communication Basics	1. Students will learn data communication technologies for Internet-of-Things (IoT) and smart cities. 2. Students can use networking software and platform to perform data exchange via the networks.	<input checked="" type="checkbox"/> Topic discussion <input checked="" type="checkbox"/> Group discussion <input type="checkbox"/> Peer review <input checked="" type="checkbox"/> Instructor feedback <input type="checkbox"/> Others: _____	<input type="checkbox"/> Tests <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> _____ exam <input type="checkbox"/> _____ report <input type="checkbox"/> Others: _____ <input type="checkbox"/> None		4	
4	Applications of Data Science and Data Communication	1. Students will gain deeper understandings in how data is generated, communicated, and interpreted in smart cities applications. 2. Student can illustrate examples of smart cities applications.	<input checked="" type="checkbox"/> Topic discussion <input checked="" type="checkbox"/> Group discussion <input type="checkbox"/> Peer review <input checked="" type="checkbox"/> Instructor feedback <input type="checkbox"/> Others: _____	<input type="checkbox"/> Tests <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> _____ exam <input type="checkbox"/> _____ report <input type="checkbox"/> Others: _____ <input type="checkbox"/> None		3	
5	Student presentations	Students can apply what they have learned from this course and propose solutions to complex social issues in smart cities.	<input type="checkbox"/> Topic discussion <input checked="" type="checkbox"/> Group discussion <input type="checkbox"/> Peer review <input checked="" type="checkbox"/> Instructor feedback <input type="checkbox"/> Others: _____	<input type="checkbox"/> Tests <input type="checkbox"/> Assignments <input type="checkbox"/> _____ exam <input type="checkbox"/> _____ report <input checked="" type="checkbox"/> Others: _oral presentation____ <input type="checkbox"/> None		3	

(5)	Teaching Methods	<p>(<input checked="" type="checkbox"/> if included; multiple choices allowed)</p> <p><input checked="" type="checkbox"/> 1. Provide primary and supplementary materials for online courses</p> <p><input type="checkbox"/> 2. Provide face-to-face teaching, number: ____ time(s), total hour(s): ____ hour(s)</p> <p><input checked="" type="checkbox"/> 3. Provide synchronous teaching, number: <u>5</u> time(s), total hour(s): <u>16</u> hour(s)</p> <p><input type="checkbox"/> 4. Provide asynchronous teaching, number: ____ time(s), total hour(s): ____ hour(s)</p> <p><input checked="" type="checkbox"/> 5. Provide topic discussion activities</p> <p><input checked="" type="checkbox"/> 6. Provide cooperative learning activities between students</p> <p><input checked="" type="checkbox"/> 7. Mutual learning through students' works</p> <p><input type="checkbox"/> 8. Others: (please specify)</p>
(6)	Learning Management System (moodle)	<p>Which moodle functions are used in this course? (<input checked="" type="checkbox"/> if included; multiple choices allowed)</p> <p>Note: For teachers and students from domestic or foreign universities who are participating in joint programs that require access to Moodle, please have the course instructor contact the platform manager at extensions 5673 or 5579. E-mail: elearn@ntnu.edu.tw</p> <p><input type="checkbox"/> 1. Personal data</p> <p><input checked="" type="checkbox"/> 2. Course information</p> <p><input type="checkbox"/> 3. Latest News release & browse</p> <p><input checked="" type="checkbox"/> 4. Course materials viewing & download</p> <p><input checked="" type="checkbox"/> 5. Grade system management & inquiry (omit if inapplicable)</p> <p><input type="checkbox"/> 6. Perform online testing (omit if inapplicable)</p> <p><input checked="" type="checkbox"/> 7. Learning information</p> <p><input checked="" type="checkbox"/> 8. Interactive learning design (chat room or discussion area)</p> <p><input type="checkbox"/> 9. Other related functions: (please specify)</p>
(7)	Public Information about Interactive Teaching	<p>Instructor Profile and Published Works (webpage link instructions can be attached): Chao Wang: https://web.ntnu.edu.tw/~cw/ Shin'ichi Konomi:</p> <hr/> <p>Instructor E-mail: Chao Wang: cw@ntnu.edu.tw; Shin'ichi Konomi: konomi.shinichi.848@m.kyushu-u.ac.jp</p> <hr/> <p>Online Office Hours (at least 1 hour per week): Wednesday 11AM-noon</p> <hr/> <p>Teaching Assistant's Name/E-mail (omit if inapplicable):</p> <hr/> <p>Others(omit if inapplicable):</p>
(8)	Course	<p>(<input checked="" type="checkbox"/> if included; multiple choices allowed)</p>

	Material Production	<input checked="" type="checkbox"/> 1. Provide appropriate reminders of key points <input checked="" type="checkbox"/> 2. Provide teaching-related examples <input checked="" type="checkbox"/> 3. Provide teaching-related exercises and reflective activities <input checked="" type="checkbox"/> 4. Provide supplementary teaching materials or online resources <input type="checkbox"/> 5. Provide instructions for self-directed learning <input checked="" type="checkbox"/> 6. Learning objectives are consistent with course goals <input type="checkbox"/> 7. Others:
(9)	Assignment Submission Method	<input checked="" type="checkbox"/> if included; multiple choices allowed) <input checked="" type="checkbox"/> 1. Provide online assignment content description <input checked="" type="checkbox"/> 2. Assignment file upload and download <input type="checkbox"/> 3. Others:
(10)	Assessment	<p>※ To comply with the spirit of online course design, please understand and agree to the contents of the following 3 items, and provide detailed description:</p> <input checked="" type="checkbox"/> 1. The course can provide evaluation results and feedback for each learning evaluation <input checked="" type="checkbox"/> 2. The evaluation has taken the students online learning history and participation level into account <input checked="" type="checkbox"/> 3. The percentage of each score is explained in detail below: (Evaluation methods, and their total score percentage) (1) Lecture attendance 20% (2) Online participation 20% (3) Hands-on homework assignments 20% (3) Student final presentation 40%
(11)	Precautions for Class:	Students should have enrolled and have passed at least one common education course in computational thinking or computer programming
(12)	<p><u>Observe intellectual property rights in the creation of course content.</u></p> <p>※ Pay attention to any infringement of copyright or other rights in the creation of relevant teaching content. ※ If the copyright for any part of the teaching content is owned by others and authorization has been obtained from the rights holder, please indicate the source of the material.</p>	