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: __計算機結構_____

2. English Course Name: __ Computer architecture __

3. Course start date: __ Spring _____ (Fall, Spring, or Summer) semester of __2026____ (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 (University's Course Committee approval in the Fall semester of 2025)

□(2) It is an existing online course; the latest University's Course Committee approval was in the _Fall_ semester of _2020_ (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	Wen-Chung Kao/ 高文忠教授
(2)	Instructor Sources	■Appointed by Departments □Appointed by General Education Center □Both of Above □Others:
(3)	College/Department/Center	Department of Electrical Engineering
(4)	School System	■Undergraduate Program □Master's Program □BA/MA Joint Course □MA/PhD Joint Course □PhD Program □Continuing Education Master's Program
(5)	Program Type	■Full-time Program □Part-time Program □Others:
(6)	Course Type	□Common Courses □General Courses □School Required Courses ■Professional Courses □Educational Courses □Other:
(7)	Required Courses	□University-required □College-required □Graduate Institute-required ■Department-required □Others:
(8)	Course Duration	■One Semester (half year) □Two Semesters (one year) □Others:
(9)	Required/Elective Course	□Required ■Elective □Others:
(10)	Course Credits	3

(11)	Average of Face-to-Face Teaching Hours Per Week	_1.31_ 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	50
(14)	EMI Courses	■Yes □No
(15)	Type of Cooperation with Domestic/Foreign Universities (omit if inapplicable)	1. Cooperative University:_____; Department/Institute: _____ Instructor Name:_____; Course Name: _____; Number of Students:_____ 2. □Partner University □Dual-Degree Program □Global Virtual Classroom Course □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	Study the practical hardware architecture of computers, design knowledge of CPUs, and software-hardware interfaces. Students taking this course should possess design knowledge of various central processing units (CPUs) and next-generation graphics processors, covering both hardware and software aspects.
(2)	Target Student Group	Individuals interested in computer organization, encompassing both hardware and software architecture, may consider Electrical Engineering, Computer Science, or related disciplines.
(3)	Prerequisite(s)	Having previously studied digital systems or logic design.

(4) Course Content Outline:

Week	**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 "None" if not designed for the week.)	**Teaching Method and Hours** (fill-in the number of hours, omit if none)		
					Face-to-Face Teaching	**Distance learning**	
						Synchronous	**Asynchronous**
1	Introduction	Understand the course structure and learning objectives in order to develop a comprehensive	■Topic discussion □Group discussion □Peer review □Instructor feedback □Others:_____	□Tests ■Assignments □_____ exam □_____ report □Others:_____		3	

			learning roadmap.		☐None			
	2	Performance & Review of Logic Design	Recognize various performance evaluation methods commonly used in logic design.	☐Topic discussion ■Group discussion ☐Peer review ☐Instructor feedback ☐Others:_____	☐Tests ■Assignments ☐_____ exam ☐_____ report ☐Others:_____ ☐None			3
	3	Instruction (I)	Understand the Digital Systems and Principles of Instruction Design	☐Topic discussion ■Group discussion ☐Peer review ☐Instructor feedback ☐Others:_____	☐Tests ■Assignments ☐_____ exam ☐_____ report ☐Others:_____ ☐None			3
	4	Instruction (II)	Understand the concepts of Machine Language and Programming Language	■Topic discussion ☐Group discussion ☐Peer review ☐Instructor feedback ☐Others:_____	■Tests ☐Assignments ☐_____ exam ☐_____ report ☐Others:_____ ☐None	3		
	5	Computer Arithmetic	Recognize Arithmetic Circuits for Addition, Subtraction, and Multiplication, Floating Point, and Other Specialized Arithmetic Circuits	☐Topic discussion ■Group discussion ☐Peer review ☐Instructor feedback ☐Others:_____	☐Tests ■Assignments ☐_____ exam ☐_____ report ☐Others:_____ ☐None			3
	6	Processors：(I)	Understand Data Path Design	☐Topic discussion ■Group discussion ☐Peer review ☐Instructor feedback ☐Others:_____	☐Tests ■Assignments ☐_____ exam ☐_____ report ☐Others:_____ ☐None			3
	7	Processors：(II)	Understand Control Unit Design	☐Topic discussion ■Group discussion ☐Peer review ☐Instructor feedback ☐Others:_____	☐Tests ■Assignments ☐_____ exam ☐_____ report ☐Others:_____			3

					☐None			
8	Processors：(III)	Understand Pipelining Design	☐Topic discussion ■Group discussion ☐Peer review ☐Instructor feedback ☐Others:_____	☐Tests ■Assignments ☐_____ exam ☐_____ report ☐Others:_____ ☐None		3	
9	Midterm Exam	Enhance understanding of the course content from Weeks 1 to 8.	☐Topic discussion ☐Group discussion ☐Peer review ■Instructor feedback ☐Others:_____	☐Tests ☐Assignments ■ midterm exam ☐_____ report ☐Others:_____ ☐None	3		
10	Memory Hierarchy (I)	Understand the concept of Cache Memory	☐Topic discussion ■Group discussion ☐Peer review ☐Instructor feedback ☐Others:_____	☐Tests ■Assignments ☐_____ exam ☐_____ report ☐Others:_____ ☐None			3
11	Memory Hierarchy (II)	Understand the concept of Virtual Memory Architecture	☐Topic discussion ■Group discussion ☐Peer review ☐Instructor feedback ☐Others:_____	☐Tests ■Assignments ☐_____ exam ☐_____ report ☐Others:_____ ☐None	3		
12	Peripheral Interface In-class test	Understand the concept of Computer Input/Output System Design	■Topic discussion ☐Group discussion ☐Peer review ☐Instructor feedback ☐Others:_____	■Tests ☐Assignments ☐_____ exam ☐_____ report ☐Others:_____ ☐None			3
13	Multiprocessor	Understand the concept of Multiprocessing Parallel Processing Mechanisms	☐Topic discussion ■Group discussion ☐Peer review ☐Instructor feedback ☐Others:_____	☐Tests ■Assignments ☐_____ exam ☐Others:_____ ☐None			3
14	Parallel	Understand the concept	☐Topic discussion	☐Tests			3

			Computing	of Instruction-Level Parallelism Mechanisms	■Group discussion □Peer review □Instructor feedback □Others:_____	■Assignments □_____ exam □Others:_____ □None			
		15	Computer Arithmetic	Understand the concept of Advanced Arithmetic Circuits	■Topic discussion □Group discussion □Peer review □Instructor feedback □Others:_____	□Tests □Assignments □_____ exam □_____ report □Others:_____ ■None		3	
		16	Final Exam	Enhance understanding of the course content from Weeks 10 to 16.	□Topic discussion □Group discussion □Peer review ■Instructor feedback □Others:_____	□Tests □Assignments ■__ Final ___ exam □_____ report □Others:_____ □None	3		

(5)	Teaching Methods	(■ if included; multiple choices allowed) ■ 1. Provide primary and supplementary materials for online courses ■ 2. Provide face-to-face teaching, number: __4__ time(s), total hour(s): __12__ hour(s) ■ 3. Provide synchronous teaching, number: __3__ time(s), total hour(s): __9__ hour(s) ■ 4. Provide asynchronous teaching, number: __9__time(s), total hour(s): __27__ hour(s) ■ 5. Provide topic discussion activities ■ 6. Provide cooperative learning activities between students ■ 7. Mutual learning through students' works □ 8. Others: (please specify)
(6)	Learning Management System (moodle)	Which moodle functions are used in this course? (■ if included; multiple choices allowed) 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 ■ 1. Personal data ■ 2. Course information ■ 3. Latest News release & browse ■ 4. Course materials viewing & download ■ 5. Grade system management & inquiry (omit if inapplicable)

		☐ 6. Perform online testing (omit if inapplicable) ■ 7. Learning information ■ 8. Interactive learning design (chat room or discussion area) ☐ 9. Other related functions: (please specify)
(7)	Public Information about Interactive Teaching	Instructor Profile and Published Works (webpage link instructions can be attached): https://sites.google.com/view/ntnusoclab/%E9%A6%96%E9%A0%81
		Instructor E-mail: jungkao@ntnu.edu.tw
		Online Office Hours (at least 1 hour per week): AM 9:00 – AM 11:00, Monday.
		Teaching Assistant's Name/E-mail (omit if inapplicable):
		Others(omit if inapplicable):
(8)	Course Material Production	(■ if included; multiple choices allowed) ■ 1. Provide appropriate reminders of key points ■ 2. Provide teaching-related examples ■ 3. Provide teaching-related exercises and reflective activities ■ 4. Provide supplementary teaching materials or online resources ■ 5. Provide instructions for self-directed learning ■ 6. Learning objectives are consistent with course goals ☐ 7. Others:
(9)	Assignment Submission Method	(■ if included; multiple choices allowed) ■ 1. Provide online assignment content description ■ 2. Assignment file upload and download ☐ 3. Others:
(10)	Assessment	※ **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:** ■ 1. The course can provide evaluation results and feedback for each learning evaluation ■ 2. The evaluation has taken the students online learning history and participation level into account ■ 3. The percentage of each score is explained in detail below: (Evaluation methods, and their total score percentage) (1) Regular exams twice: 20% (2) Scores for regular homework assignments: 30%

		(3) Midterm examination: 25% (4) Final examination: 25%
(11)	Precautions for Class:	1. Please make sure to follow the unit schedule for learning and attend synchronous online sessions on time. 2. Submit course practical assignments punctually. 3. Respect the intellectual property rights of the course materials.
(12)	**Observe intellectual property rights in the creation of course content.** ※ 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.	