

114學年度第1學期 課程教學大綱

中文名稱	計算機網路			課號	EE5310
英文名稱	COMPUTER NETWORK				
課程類別	講授類	必選修	選修	系所	電機工程學系碩士班
授課教師	許蒼嶺			學分	3

課程大綱 Course syllabus

1. Overview of Data Networks and Protocols
2. Wireless Transmission and Communications
3. WiFi vs 4G/5G/6G
4. Personal Area Networks (Bluetooth, Sensors, RFID)
5. Transport Protocols
6. Internet Protocols
7. Integrated and Differentiated Services
8. Protocols for QoS Support
9. SDN, NFV, Network Slicing, Mobile Edge Computing

課程目標 Objectives

Provide graduate students an advanced study in networking protocols and technologies.

授課方式 Teaching methods

lectures

評分方式〔評分標準及比例〕Evaluation (Criteria and ratio)

1. Midterm Exam : 35%
2. Final Exam : 35%
3. Projects : 30%

參考書/教科書/閱讀文獻 Reference book/ textbook/ documents〔請遵守智慧財產權觀念，不可非法影印〕

序號	作者	書名	出版社	出版年	出版地	ISBN#
No.	Author	Title	Publisher	Year of publish	Publisher place	ISBN#
1	Ying-Dar Lin, Ren-Hung Hwang, and Fred Baker	Computer Networks: An Open Source Approach	McGraw-Hill International Edition	2022	USA	978-0-07-131587-6

課程時數規劃 Course Hour Planning

本校自114學年度起實施學期16週，仍以1學分18小時為原則。教師課程時數安排得選擇「16週+自主學習規劃」或「16週+實體上課規劃」。
Starting from the 114th academic year, the university will implement a 16-week course schedule, while maintaining the standard of 18 hours of instruction per credit. Instructors can

choose between “16-weeks + Alternative learning periods” or “16-weeks + In-person classes.”

☒ 本門課程為「16週+自主學習規劃」：教師需於「A.每週課程內容及預計進度」欄位填寫16週課程進度，並於「B.自主學習規劃」欄位填寫每1學分2小時學生自主學習內容。

16 weeks + alternative learning periods: The instructor will include a 16-week course plan in the weekly scheduled progress section (16 hours of instruction per credit) and provide details of the learning plan (two hours of activity per credit) in the alternative learning period section.

☐ 本門課程為「16週+實體上課規劃」：教師需於「A.每週課程內容及預計進度」欄位填寫16週課程進度，並於「C.實體上課規劃」填寫2次授課內容及主題。

16 weeks + in-person classes: The instructor will include a 16-week course plan in the weekly scheduled progress section (16 hours of instruction per credit) and specify the content and topics of the 2 in-person classes in the in-person class plan section.

A.每週課程內容及預計進度 Weekly scheduled progress

全英課程之授課內容及主題應以英文或雙語呈現

For courses taught entirely in English, the content and topics should be presented in English or bilingually.

週次	日期	授課內容及主題
Week	Date	Content and topic
1	2025/09/07~2025/09/13	Overview of Data Networks and Protocols
2	2025/09/14~2025/09/20	Application Protocols-Video Streaming
3	2025/09/21~2025/09/27	Linux Sockets
4	2025/09/28~2025/10/04	Transport Protocols (TCP)
5	2025/10/05~2025/10/11	Transport Protocols (TCP)
6	2025/10/12~2025/10/18	Flow and Congestion Control
7	2025/10/19~2025/10/25	Internet Protocols (IP)
8	2025/10/26~2025/11/01	期中考試
9	2025/11/02~2025/11/08	Integrated and Differentiated Services
10	2025/11/09~2025/11/15	Protocols for QoS Support (RTP/RTCP)
11	2025/11/16~2025/11/22	Wireless Communication Technologies
12	2025/11/23~2025/11/29	Wireless LANs (Wi-Fi)
13	2025/11/30~2025/12/06	Cellular Networks-4G/5G/6G
14	2025/12/07~2025/12/13	Personal Area Networks (Bluetooth, Sensors, RFID)
15	2025/12/14~2025/12/20	Non-Terrestrial Networks and LEO
16	2025/12/21~2025/12/27	期末考試

B.自主學習規劃 Alternative learning periods

課程規劃學生自主學習內容（每1學分2小時）

Alternative learning periods planned for the course (with each credit corresponding to two hours of activity)

本門課程規劃學生彈性或自主學習內容（每1學分2小時）：

Alternative learning periods planned for the course (each credit corresponds to two hours of activity):

學生自主學習活動 Alternative learning periods	勾選或填寫規劃內容 Place a check in the appropriate box or provide details	時數 Number of hours
學生分組實作及討論 Group work and discussion	☒	3
參與課程相關作業、作品、實驗 Participation in course-related assignments, work, or experiments	☐	
參與校內外活動（研習營、工作坊、參訪）或競賽 Participation in on- or off-campus activities (e.g., seminars, workshops, and visits) or competitions	☐	
課外閱讀 Extracurricular reading	☒	6
線上數位教材學習 Learning with online digital learning materials	☒	3
其他（請填寫規劃內容） Other (please provide details)	☐	

C.實體上課規劃 In-Person Class Plan

若無規劃學生自主學習，則請教師規劃2次實體上課(每1學分2小時)，上課時間由師生自行討論，得利用週三下午4-7點或其他時段進行。

If there are no alternative learning periods planned for the course, the instructor should plan 2 in-person classes (2 hours of activity per credit). Class schedules can be arranged through discussions between instructors and students, utilizing Wednesday afternoons or other suitable time slots.

* 第一次實體上課內容及主題 (Content and topic for the first In-Person class)：

* 第二次實體上課內容及主題 (Content and topic for the second In-Person class)：

課業討論時間 Office hours

時段1 Time period 1:
時間 Time：星期二10:00-12:00
地點 Office/Laboratory：EC8010
時段2 Time period 2：
時間 Time：星期三10:00-12:00
地點 Office/Laboratory：EC8010

本課程欲培養之系所學生專業能力/全校學生基本素養與核心能力

系所學生專業能力/全校學生基本素養與核心能力 basic disciplines and core capabilities of the department and the university	課堂活動與評量方式 Class activities and evaluation										
	本課程欲培養之能力與素養 This course enables students to achieve.	紙筆考試或測驗 Test.	課堂討論(含個案討論) Group discussion (case analysis).	個人書面報告、作業、作品、實驗 Indivisual paper report/assignment/work or experiment.	群組書面報告、作業、作品、實驗 Group paper report/assignment/work or experiment.	個人口頭報告 Indivisual oral presentation.	群組口頭報告 Group oral presentation.	課程規劃之校外參訪及實習 Off-campus visit and intership.	證照/檢定 License.	參與課程規劃之校內外活動及競賽 Participate in off-campus/on-campus activities and competitions.	課外閱讀 Outside reading.
※系所學生專業能力 Basic disciplines and core capabilities of the department											
1.具備前瞻性電機專業理論整合與分析之能力。1. The ability to be proactive integration and analysis of professional motor theory.	V		V	V							
2.具備運用先進電機專業技術進行研發並解決問題之能力。2. The ability to apply advanced motor research and development expertise and solving problems.	V		V	V							
3.能夠遵守專業倫理，並具備團隊合作精神與領導統御之能力。3. Be able to comply with professional ethics and the ability to teamwork and leadership skills.											
4.能夠融合眾人智慧並提昇自我潛能，以具備獨立思考與研究創新之能力。4. Be able to integrate the wisdom of the people and enhance their potential to have the ability to think independently and Innovation Research.											
5.能夠吸收尖端電機新知並結合世界發展潮流，以具備國際化競爭之能力。5. Be able to absorb											

new knowledge combined with cutting-edge world development trend, the ability of international competition.											
※全校學生基本素養與核心能力 Basic disciplines and core capabilities of the university											
1.表達與溝通能力。1. Articulation and communication skills											
2.探究與批判思考能力。2. Inquisitive and critical thinking abilities	V	V	V	V							
3.終身學習能力。3. Lifelong learning											
4.倫理與社會責任。4. Ethics and social responsibility											
5.美感品味。5. Aesthetic appreciation											
6.創造力。6. Creativity											
7.全球視野。7. Global perspective											
8.合作與領導能力。8. Team work and leadership											
9.山海胸襟與自然情懷。9. Broad-mindedness and the embrace of nature											

本課程與SDGs相關項目

- ☐ SDG1-消除貧窮(No Poverty)
- ☐ SDG2-消除飢餓 (Zero Hunger)
- ☐ SDG3-良好健康與福祉(Good Health and Well-being)
- ☐ SDG4-教育品質(Quality Education)
- ☐ SDG5-性別平等(Gender Equality)
- ☐ SDG6-乾淨水源與公共衛生(Clean Water and Sanitation)
- ☐ SDG7-可負擔乾淨能源(Affordable and Clean Energy)
- ☐ SDG8-優質工作與經濟成長(Decent Work and Economic Growth)
- ☐ SDG9-工業、創新和基礎建設(Industry,Innovation and Infrastructure)
- ☐ SDG10-減少不平等(Reduced Inequalities)
- ☐ SDG11-永續城市(Sustainable Cities and Communities)
- ☐ SDG12-責任消費與生產(Responsible Consumption and Production)
- ☐ SDG13-氣候行動(Climate Action)
- ☐ SDG14-海洋生態(Life Below Water)
- ☐ SDG15-陸域生態(Life on Land)

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| ☐ | SDG16-和平、正義和穩健的制度(Peace,Justice And Strong Institutions) |
| ☐ | SDG17-促進目標實現的全球夥伴關係(Partnership for the Goals) |
| ☐ | 本課程和SDGS無關 |

本課程校外實習資訊:**This course is relevant to internship:**

☐ 本課程包含校外實習（本選項僅供統計使用，無校外實習者，得免勾記）
The course includes internship.(For statistical use only. If the course without internship, please ignore this item.)

實習定義：規劃具有學分或時數之必修或選修課程，且安排學生進行實務與理論課程實習，於實習終了取得考核證明繳回學校後，始得獲得學分；或滿足畢業條件者。（一般校內實習請勿勾選此欄位）

Internship: The required or elective courses should include credits and learning hours. Students should participate in the corporative company or institution to practice and learn the real skills. An internship certification must be handed in at the end of internship to get the credits or to fulfil the graduation requirements.

[回課程列表](#)