

## **Undergraduate Program in Department of Computer Science and Information Engineering (BS), 2022**

This department was established to face the trends of artificial intelligence and computer science, as well as to meet the demands of domestic industries. Course instruction in this department not only focuses on lectures on the professional knowledge of artificial intelligence, software development, project management and database system operations, but also provides hands-on experience designed to prepare students for the positions in systems development and management in the IT field. It is hoped that academic theories and practical works can be used to affirm each other, and students can shorten their learning process after graduation at the beginning of their careers.

The undergraduate study in the Department of Computer Science and Information Engineering (CSIE) Specialty in Artificial Intelligence offers in-depth courses in various areas, with particular emphasis in computer vision, natural language processing, security and privacy, software debugging, robotics, and machine learning, etc. Our distinguished faculty have a wide range of research themes; together, they lead a coherent program to advance studies in particular subfield of computer science. This program welcomes students who are interested in Artificial Intelligence. More information, please visit the Department of Computer Science and Information Engineering (CSIE), Asia University.

# 111 學年度資訊工程學系大學部全英語課程規劃

## Course Curriculum for Undergraduate Program in Department of Computer Science and Information Engineering 2020 (English-Taught Program)

資訊工程學系學士學位學程

Undergraduate Program in Department of Computer Science and Information Engineering

畢業總學分：128 學分

111.04.21 校課程委員會通過

Credits for Graduation: 128

Approved by the University Curriculum Committee on 21/04/2022

類別 Category	科目名稱 Course Title	CEFR 等級	修課 年級 Year of the Program	修課 學期 Semester	學分數 Credits	每週上課時數 Hours per week		備 註 Remarks		
						講授 Lecture	練習 Practice			
(24) Program Required Credits	中文類 10 學分	進階華語文會話與聽力(一) High-Intermediate Chinese Conversation and Listening I	B1	1 <sup>st</sup>	1 <sup>st</sup>	2	2	1		
		進階華語文會話與聽力(二) High-Intermediate Chinese Conversation and Listening II	B1	1 <sup>st</sup>	2 <sup>nd</sup>	2	2	1		
		中級中文文法 Intermediate Chinese Grammar	B1	1 <sup>st</sup>	2 <sup>nd</sup>	2	2	0		
		高階華語文會話與聽力(一) Advanced Chinese Conversation and Listening I	B2	2 <sup>nd</sup>	1 <sup>st</sup>	2	2	1		
		時事華語 Current Affairs in Chinese	B2	2 <sup>nd</sup>	1 <sup>st</sup>	2	2	0		
		英文類 8 學分	共通英語文(一) English for General Purposes (1)		1 <sup>st</sup>	1 <sup>st</sup>	3	3	0	分級上課
		共通英語文(二) English for General Purposes (2)		1 <sup>st</sup>	2 <sup>nd</sup>	3	3	0	分級上課	
		共通專業英語文 English for General Specific Purposes		2 <sup>nd</sup>	1 <sup>st</sup>	2	2	0	依系院上/下學期開課	
		核心 通識課程 6 學分	歷史與文化 臺灣/中國文化導讀(二) Introduction of Taiwanese / Chinese Culture II	B2	1 <sup>st</sup>	1 <sup>st</sup>	2	2	0	
			健康與生活 Health and Life		1 <sup>st</sup>	2 <sup>nd</sup>	2	2	0	
	法律與生活 娛樂、智慧財產權與法律 Law & Life 愛情、性別與法律 Love, Gender and Law			1 <sup>st</sup>	1 <sup>st</sup> or 2 <sup>nd</sup>	2	2	0	三選一 One Choice from Three	
	(6) Program Elective Credits	資訊科技類 資訊科技與華語表達訓練 Practice of Chinese Oral Expression through Information Technology	B1	1 <sup>st</sup>	2 <sup>nd</sup>	2	2	0		
		語文類 進階華語文閱讀與寫作 High-Intermediate Chinese Reading and Writing	B1	1 <sup>st</sup>	2 <sup>nd</sup>	2	2	0		
		學術華語文 Chinese for Academic Purposes	C1	2 <sup>nd</sup>	2 <sup>nd</sup>	2	2	0		
		*專業華語文	B2	2 <sup>nd</sup>	1 <sup>st</sup>	2	2	0	專業華語目前提供醫學華語與商業華	

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						講授 Lecture	練習 Practice	
	Chinese for Specific Purposes							語，視選課需要而定。
	高階華語文會話與聽力(二) Advanced Chinese Conversation and Listening II	B2	2 <sup>nd</sup>	1 <sup>st</sup>	2	2	1	
	服務與學習(一)(二)-實作課 Service and Learning		1 <sup>st</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	0	1.5	0	Time of class: (1) New student orientation, (2) arranged and announced by student services
	服務與學習(一)(二)-講授課 Service and Learning(1)(2)-Lecture		1 <sup>st</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	0	2	0	
	台華文化涵養護照(國際生畢業門檻、不計學分) Certificate of Taiwan-Chinese Cultural Understanding (Non-Credit Graduation Threshold)		1 <sup>st</sup> ~4 <sup>th</sup>	1 <sup>st</sup> or 2 <sup>nd</sup>	0	2	0	本畢業門檻不計學分，大學部學生須於4年期間，參與至少8次文化活動，全英文授課國際生，參與至少4次文化活動，並完成學習心得報告。
	通識涵養教育(不納入畢業學分) General Literacy Series (non-credit)		1 <sup>st</sup> ~4 <sup>th</sup>	1 <sup>st</sup> or 2 <sup>nd</sup>	0	2		大學日間部須於在學期間至少參與4次(符合健康力1次、關懷力1次、創新力1次及卓越力1次)，並完成學習成效評估，成績以P/F(通過/不通過)計分。
以院為教學核心課程12學分	基礎程式設計(一)~(三) Fundamental Computer Programming (1)~(3)		1 <sup>st</sup>	1 <sup>st</sup>	3	3	0	Python Programming
	人工智慧與雲端應用 Artificial Intelligence and Cloud Applications		2 <sup>nd</sup>	1 <sup>st</sup>	3	3	0	
	進階程式設計 Advanced Computer Programming		1 <sup>st</sup>	2 <sup>nd</sup>	3	3	0	Including Object-oriented Python Programming
	畢業專題(一) Special Projects (I)		3 <sup>rd</sup>	2 <sup>nd</sup>	1	1	0	
	畢業專題(二) Special Projects (II)		4 <sup>th</sup>	1 <sup>st</sup>	1	1	0	
	資訊研討 Information Technology Seminar		4 <sup>th</sup>	2 <sup>nd</sup>	1	1	0	
系核心課程36學分	資訊數學 Information Mathematics		1 <sup>st</sup>	1 <sup>st</sup>	3	3	0	
	線性代數 Linear Algebra		1 <sup>st</sup>	1 <sup>st</sup>	3	3	0	
	機率與統計 Probability and Statistics		1 <sup>st</sup>	2 <sup>nd</sup>	3	3	0	
	離散數學 Discrete Mathematics		1 <sup>st</sup>	2 <sup>nd</sup>	3	3	0	
	視窗程式設計 Windows Programming		2 <sup>nd</sup>	1 <sup>st</sup>	3	3	0	
	計算機網路概論 Introduction of Computer Network		2 <sup>nd</sup>	1 <sup>st</sup>	3	3	0	
	網頁系統開發 Web-Based System Programming		2 <sup>nd</sup>	2 <sup>nd</sup>	3	3	0	Including JAVA Programming
	資料結構與演算法 Data Structures and Algorithms		2 <sup>nd</sup>	2 <sup>nd</sup>	3	3	0	
	數位邏輯 Digital Logics		2 <sup>nd</sup>	2 <sup>nd</sup>	3	3	0	

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						講授 Lecture	練習 Practice		
	資料庫系統概論 Introduction to Database Systems		3 <sup>rd</sup>	1 <sup>st</sup>	3	3	0		
	作業系統概論 Introduction to Operating Systems		3 <sup>rd</sup>	1 <sup>st</sup>	3	3	0		
	微處理器與嵌入式系統 Microprocessor and Embedded Systems		3 <sup>rd</sup>	2 <sup>nd</sup>	3	3	0		
系專業選修學程 18學分 Department elective 18 credits	人工智慧學程 Artificial Intelligence Program	資料科學 Data Science	2 <sup>nd</sup>	1 <sup>st</sup>	3	3	0	本系學程選修課目，不得以通識教育課目之相同或類似科目抵免。 This department's elective courses cannot be substituted with identical or similar courses in the standard curriculum.	
		機器學習 Machine Learning	2 <sup>nd</sup>	2 <sup>nd</sup>	3	3	0		
		大數據資料處理 Big Data Information Processing	3 <sup>rd</sup>	1 <sup>st</sup>	3	3	0		
		深度學習 Deep Learning	3 <sup>rd</sup>	1 <sup>st</sup>	3	3	0		
		人機介面 Human Machine Interface	4 <sup>th</sup>	1 <sup>st</sup>	3	3	0		
		智慧物聯網 Artificial Intelligence & Internet of Things (AIoT)	4 <sup>th</sup>	2 <sup>nd</sup>	3	3	0		
		數位內容學程 Digital Content Program	多媒體導論 Introduction to Multimedia	2 <sup>nd</sup>	1 <sup>st</sup>	3	3		0
			數位內容資訊安全 Information Security	2 <sup>nd</sup>	2 <sup>nd</sup>	3	3		0
	數位影像處理 Digital Image Processing		3 <sup>rd</sup>	1 <sup>st</sup>	3	3	0		
	人機介面 Human Machine Interface		3 <sup>rd</sup>	2 <sup>nd</sup>	3	3	0		
	智慧電子學程 Intelligent Electronic Program	電腦繪圖與動畫 Computer Graphics and Animation	4 <sup>th</sup>	1 <sup>st</sup>	3	3	0		
		行動遊戲設計 Mobile Game Design	4 <sup>th</sup>	2 <sup>nd</sup>	3	3	0		
		電子電路 Electronic Circuits	2 <sup>nd</sup>	2 <sup>nd</sup>	3	3	0		
		感測原理 Principle of Sensor	3 <sup>rd</sup>	1 <sup>st</sup>	3	3	0		
		數位通訊 Digital Communications	3 <sup>rd</sup>	1 <sup>st</sup>	3	3	0		
		網際網路實務 Internet Practice	3 <sup>rd</sup>	2 <sup>nd</sup>	3	3	0		
	Major electives	無線網路 Wireless Networking	4 <sup>th</sup>	1 <sup>st</sup>	3	3	0		
		智慧物聯網 Artificial Intelligence & Internet of Things (AIoT)	4 <sup>th</sup>	2 <sup>nd</sup>	3	3	0		
工程倫理暨資訊法律與服務 Engineering Ethic and Information Law and Services		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0			
數位系統設計 Digital System Design		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0			
工程數學 Engineering Mathematics		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0			
資訊檢索 Information Retrieval		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0			
	資料視覺化 Data Visualization		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0		

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						講授 Lecture	練習 Practice	
	雲端運算實務 Cloud Computing Practice		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	產品設計與發展 Product Design and Development		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	智慧型監控系統與實務 Intelligent Monitor System and Practice		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	資料探勘 Data Mining		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	計算機組織 Computer Organization		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	智慧型終端設計基礎理論 Design Theorem of Smart End Device		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	串流平台技術 Streaming Platform Technology		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	行動資料儲存管理技術 Management Technology of Mobile Data Storage		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	雲端服務平台整合應用 Integration and Application of Cloud Computing Platform		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	多媒體網路技術應用 Multimedia Network Technologies and Application		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	HTML 5 Web APP 設計與開發 Design and Development of HTML 5 Web APPs		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	互動式多媒體設計 Interactive Multimedia Design		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	電子書標準及製作 E-Book Standards and Production		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	區塊鏈應用與實作 Blockchain Application and Implementation		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	
	無人機程式設計 Drone Programming		2 <sup>nd</sup> -4 <sup>th</sup>	1 <sup>st</sup> 、2 <sup>nd</sup>	3	3	0	

Note(註)：

一、學生含通識課程應修畢 128 學分(含)以上始能畢業，其中含通識課程(必修語文課程、核心通識及通識選修) 30 學分，院基礎學程 12 學分、系核心學程 36 學分，餘不足 128 學分之學分數，需另修習「系專業選修學程」、「系自由選修課程」課程學分補足其不足學分數，始得畢業。

Students must complete 128 credits including the standard curriculum in order to graduate. The standard curriculum (language requirements, core curriculum, and standard curriculum electives) includes 30 credits. The school standard curriculum includes 12 credits and the completion of the “professional curriculum of department” of 36 credits are required. Students with less than 128 credits are required to take “department professional electives” or “major electives curriculum” to make up for credits required for graduation.

二、通識教育開授科目，請參考本校通識教育中心之課程計畫與規定。

For a list of standard curriculum courses, please refer to the school’s standard curriculum education center’s curriculum planning and regulations.

三、有關國際生修習本校以全英語授課之博雅通識課程英語文能力規定，依語文教學研究發展中心規劃辦法辦理。

International students enrolled in the university’s standard liberal arts curriculum should follow the rules set by The Center for the Development of Language Teaching and Research.

四、有關僑生、港澳生、陸生修習本校以全英語授課之博雅通識課程規定，比照國際生通識課程辦理。

About the rules of students from Hong Kong, Macau, China, and overseas Chinese students enrolled in the university’s standard liberal arts curriculum will be the same as international student standard curriculums.

## Course Description

Course Title	Course description
Fundamental Computer Programming (1)~(3) 基礎程式設計(一)~(三)	Fundamental Computer Programming (1)~(3) courses are focuses on training the computer programming in Python. This course will demonstrate the programming skill with several examples.
Advanced Computer Programming 進階程式設計	Advanced Computer Programming course is focus on training the skill of Object-Oriented Programming (OOP) in Python. This course will demonstrate the OOP skill with several examples. The student must finish the team project before the end of course.
Web base system programming 網頁系統開發	Web based System Programming course is focus on training the skill of Web System development in PHP. This course will demonstrate both JAVA Programming and PHP Web System creation skills with several examples. The student must finish the team project before the end of course.
Data Science 資料科學	This course includes basic skills for analyzing different types of data including images, video, voice, text and structural records. We learn concepts such as exploratory data analysis, statistical inference and modeling, machine learning, and high dimensional data analysis.
Machine learning 機器學習	This course introduces the concepts and theories of fundamental machine learning approaches, including “Supervised Learning” and “Unsupervised Learning”. To enhance the abilities to handle real applications, the students enrolled are requested to learn “Python” programming language in advance and have middle/final projects in groups with the data collected by their own.
Big Data Information Processing 大數據資料處理	This course gives hand-on practical experiences of handling the huge amount of textual data via Hadoop cluster. The techniques introduced in this course for handling these textual data including, (1) “How to collect data from the web automatically via Web Robot? (2) How to use “MapReduce” programming” to speed up computation? (3) “How to setup Windoop cluster using general PCs?” and (4) How to have computation and storages in cloud platform?”
Deep learning 深度學習	Deep learning is a branch of machine learning. It is an algorithm that uses artificial neural networks as a framework to characterize and learn data. So far, several deep learning frameworks, such as deep neural networks, convolutional neural networks and deep confidence networks, and recurrent neural networks have been applied in computer vision, speech recognition, natural language processing, audio recognition and bioinformatics. And other fields have achieved excellent results. In this class, we will introduce the basic algorithms and models of deep learning. Students will learn to use TensorFlow to do their projects and develop their applications.
AI Cloud Computing Practice AI雲端運算實務	Cloud computing market has grown exponentially over the years and is expected to grow at even faster pace. One other reason behind the success of cloud computing is the flexibility it offers like, Infrastructure as a service (IaaS), Software as a Service (SaaS) and Platform as a Service (PaaS). AI enables machines to learn, think, act, and react like human beings. AI helps machines to analyze and learn from the historical data, identify patterns and make real-time decisions. There are cloud machine learning platforms like Google Cloud Machine Learning which combine machine learning with the cloud. Students will understand Google Cloud Platform and its Cloud AI services and explore the Google machine learning services.

## Faculty Members

Instructor's title	Instructor's name	Contact Information
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助理教授 Assistant Professor	楊偉儒 博士 Dr. Wei-Zu Yang	Ext (or Mobile): 1843 Email: wzyang@asia.edu.tw
講師 lecturer	關國裕 博士 Dr. Kuo-Yu Kuan	Ext (or Mobile): 20065 Email: kky@asia.edu.tw