Undergraduate Program in Department of Computer Science and Information Engineering (BS), 2021

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.

110 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　　　　　　　　110.11.15 校課程委員會通過
Credits for Graduation: 128　　　　　　Approved by the University Curriculum Committee on 15/11/2021

類別 Category			科目名稱 Course Title	CEFR 等級 CEFR	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	
(30) University Required Credits	(24) Program Required Credits	必修語文課程 18 學分	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	1st	1st	2	2	1	
			進階華語文會話與聽力(二) High-Intermediate Chinese Conversation and Listening II	B1	1st	2nd	2	2	1	
			中級中文文法 Intermediate Chinese Grammar	B1	1st	2nd	2	2	0	
			高階華語文會話與聽力(一) Advanced Chinese Conversation and Listening I	B2	2nd	1st	2	2	1	
			時事華語 Current Affairs in Chinese	B2	2nd	1st	2	2	0	
		英文類 8 學分	共通英語文(一) English for General Purposes (1)		1st	1st	3	3	0	分級上課
			共通英語文(二) English for General Purposes (2)		1st	2nd	3	3	0	分級上課
			共通專業英語文 English for General Specific Purposes		2nd	1st	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	1st	1st	2	2	0	
			健康保健	健康與生活 Health and Life		1st	2nd	2	2	0	
			法律與生活	娛樂、智慧財產權與法律 Entertainment and Intellectual Property Law		1st	1st or 2nd	2	2	0	三選一 One Choice from Three
				法律與生活 Law & Life							
				愛情、性別與法律 Love, Gender and Law							
	(6) Program Elective Credits	通識選修 6 學分	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	1st	2nd	2	2	0	
			語文類	進階華語文閱讀與寫作 High-Intermediate Chinese Reading and Writing	B1	1st	2nd	2	2	0	
				學術華語文 Chinese for Academic Purposes	C1	2nd	2nd	2	2	0	
				*專業華語文 Chinese for Specific Purposes	B2	2nd	1st	2	2	0	專業華語目前提供醫學華語與商業華

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	
										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	2nd	1st	2	2	1	
			服務與學習(一)(二)－實作課 Service and Learning		1st	1st、2nd	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		1st	1st、2nd	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)		1st~4th	1st or 2nd	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)		1st~4th	1st or 2nd	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	College required 12 credits		基礎程式設計(一)~(三) Fundamental Computer Programming (1)~(3)		1st	1st	3	3	0	Python Programming
			人工智慧概論 Introduction to Artificial Intelligence		2nd	1st	3	3	0	
			進階程式設計 Advanced Computer Programming		1st	2nd	3	3	0	Including Object-oriented Python Programming
			畢業專題（一） Special Projects (I)		3rd	2nd	1	1	0	
			畢業專題（二） Special Projects (II)		4th	1st	1	1	0	
			資訊研討 Information Technology Seminar		4th	2nd	1	1	0	
系核心課程36學分	Department required 36 credits		資訊數學 Information Mathematics		1st	1st	3	3	0	
			機率與統計 Probability and Statistics		1st	1st	3	3	0	
			線性代數 Linear Algebra		1st	2nd	3	3	0	
			離散數學 Discrete Mathematics		1st	2nd	3	3	0	
			視窗程式設計 Windows Programming		2nd	1st	3	3	0	
			計算機網路概論 Introduction of Computer Network		2nd	1st	3	3	0	
			網頁系統開發 Web-Based System Programming		2nd	2nd	3	3	0	Including JAVA Programming
			資料結構與演算法 Data Structures and Algorithms		2nd	2nd	3	3	0	
			數位邏輯 Digital Logics		2nd	2nd	3	3	0	

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	
系專業選修學程 18 學分 Department elective 18 credits			資料庫系統概論 Introduction to Database Systems		3rd	1st	3	3	0	
			作業系統概論 Introduction to Operating Systems		3rd	1st	3	3	0	
			微處理器與嵌入式系統 Microprocessor and Embedded Systems		3rd	2nd	3	3	0	
	人工智慧學程	Artificial Intelligence Program	資料科學 Data Science		2nd	1st	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		2nd	2nd	3	3	0	
			大數據資料處理 Big Data Information Processing		3rd	1st	3	3	0	
			深度學習 Deep Learning		3rd	1st	3	3	0	
			人機介面 Human Machine Interface		4th	1st	3	3	0	
			智慧物聯網 Artificial Intelligence & Internet of Things (AIoT)		4th	2nd	3	3	0	
	數位內容學程	Digital Content Program	多媒體導論 Introduction to Multimedia		2nd	1st	3	3	0	
			數位內容資訊安全 Information Security		2nd	2nd	3	3	0	
			數位影像處理 Digital Image Processing		3rd	1st	3	3	0	
			人機介面 Human Machine Interface		3rd	2nd	3	3	0	
			電腦繪圖與動畫 Computer Graphics and Animation		4th	1st	3	3	0	
			行動遊戲設計 Mobile Game Design		4th	2nd	3	3	0	
	智慧電子學程	Intelligent Electronic Program	電子電路 Electronic Circuits		2nd	2nd	3	3	0	
			感測原理 Principle of Sensor		3rd	1st	3	3	0	
			數位通訊 Digital Communications		3rd	1st	3	3	0	
			網際網路實務 Internet Practice		3rd	2nd	3	3	0	
			無線網路 Wireless Networking		4th	1st	3	3	0	
			智慧物聯網 Artificial Intelligence & Internet of Things (AIoT)		4th	2nd	3	3	0	
系自由選修課程	Major electives		工程倫理暨資訊法律與服務 Engineering Ethic and Information Law and Services		2nd-4th	1st、2nd	3	3	0	
			數位系統設計 Digital System Design		2nd-4th	1st、2nd	3	3	0	
			工程數學 Engineering Mathematics		2nd-4th	1st、2nd	3	3	0	
			資訊檢索 Information Retrieval		2nd-4th	1st、2nd	3	3	0	
			資料視覺化 Data Visualization		2nd-4th	1st、2nd	3	3	0	

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

系所主管簽章：　　　　　　　學院院長簽章：　　　　　　　國際學院院長簽章：

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.

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