

108 Academic Year (2019 Admission) NDHU CSIE International Undergraduate Program

Planning

University Requirements:

See [Academic Regulations](#) and [General Education Requirements](#) of NDHU.

General Education Requirements:

Including Language subjects 9 credits, Physical Education 4 credits, Service Learning 2 credits, Information Technology 2 credits, General Education Fundamental Course 20 credits, and other credits from Dept of CSIE, with at least 132 total academic credits to graduate.

See Full List of [General Education Requirements](#) of NDHU for detail.

Departmental Requirements:

In addition to the General Education Requirements from the University, students are required to take 3 Major Programs and at least one of two Professional Elective Programs (as a declared major) from the Department of CSIE, or any program-set from any other department of NDHU (deemed as a minor), and study at least 132 total credits in order to graduate.

II. Important Rules and Regulations:

1. To graduate with a Bachelor Degree in Computer Science and Information Engineering, all students must fulfill the General Education Requirements and complete 4 curriculum programs:

Fundamental Program of Electrical Engineering and Computer Science:23 credits

Core Program of Computer Science (I):26 credits

Core Program of Computer Science (II):23 credits

and one Professional Elective Program: (alternative)

Program of Multimedia and Intelligent Computing:21 credits

Program of Network and System:21 credits

and study a minimum of 132 credits.

At least **half of the 132 credits must be taught in English** .

The professional elective programs can be any curriculum module offered by the CSIE or other departments.

2. Credits earned in courses of the same name offered by other departments or institutes may be counted toward degree requirements with the approval of the Departmental Education Committee.

3. The maximum credit load per semester is 24 credits with the exception of Physical Education and Military Training and Service Learning. The maximum credit load can be increased to 27 credits per semester for those in the top 25% ranking of their respective classes.

4. All Students must successfully complete Service Learning (I) & (II) offered by Dept. of CSIE before graduation.

5. All students must pass the Primary Programming Proficiency (PPP) Requirements in order to graduate.

6. For any students come from 5-year Middle School(Junior High)/High School education system, must take an additional 12 credits (as total 144 credits) to graduate. These 12 credits can be from any departments.

7. In addition to this requirement, all scholarship awardees must follow the scholarship regulations and requirements to complete the degree.

8. All students admitted for Fall 2017 and after, should complete the cross-disciplinary self-learning credit certification. Detailed rules and regulations about this certification, please refer to the "Guidelines for Cross-Disciplinary Self Learning Credit Certification" of the Office of Student Affairs.

9. At least 21 credits are required to fulfill the Professional Elective Program toward CSIE degree.
10. All Students must take required courses offered by the CSIE department to fulfill the required credits of information technology category; students can refer to the list of the credit-eligible courses announced by the General Education Center. If the credits of an eligible course taken is not sufficient to satisfy the General Education requirements, students still need to make up for the remaining credits by taking other General Education courses.

III. The Major Programs consist of 3 programs:

A. Fundamental Program of Electrical Engineering and Computer Science (total 23 Credits)

COURSE NAME	COURSE CODE	CREDIT	YEAR	SEMESTER	REMARK
Calculus (I)	AM__10500	3.0	1st	Fall	
Calculus (II)	AM__10800	3.0	1st	Spring	
General Physics (I)	PHYS10000	3.0	1st	Fall	
General Physics (II)	PHYS10200	3.0	1st	Spring	
General Physics Lab. (I)	PHYS10100	1.0	1st	Fall	
General Physics Lab. (II)	PHYS10300	1.0	1st	Spring	
Introduction to Computer Programming (I)	CSIEB0020	3.0	1st	Fall	
Linear Algebra	CSIEB0060	3.0	1st	Spring	
Introduction to Computer Science	CSIEB0010	3.0	1st	Fall	

B. Core Program of Computer Science (I) (total 26 Credits)

Course Name	Course Code	Credit	Year	Semester	Remark
Introduction to Computer Programming (I)	CSIEB0020	3	1st	Fall	
Lab of Programming (I)	CSIEB0030	1	1st	Fall	
Introduction to Computer Programming (II)	CSIEB0040	3	1st	Spring	
Lab of Programming (II)	CSIEB0050	1	1st	Spring	
Digital Logic Design	CSIEB0070	3	2nd	Fall	
Digital Systems Laboratory	CSIEB0110	1	2nd	Spring	
Data Structures	CSIEB0100	3	2nd	Fall	
Lab of Data Structures	CSIEB0230	1	2nd	Fall	
Algorithm Design and Analysis	CSIEB0120	3	2nd	Spring	
Lab of Algorithm Design	CSIEB0180	1	2nd	Spring	

Operating Systems	CSIEB0170	3	3rd	Fall	
Discrete Mathematics	CSIEB0080	3	2nd	Fall	
1. Students must pass Introduction to Computer Programming (I) or (II) in order to proceed to Data Structures and/or Algorithm Design and Analysis classes. 2. CSIE students must take the Introduction to Computer Programming (I) and (II) offered for the CSIE major, unless approved by the Departmental Education Committee prior to the class enrollment.					

C. Core Program of Computer Science (II) (total 23 Credits)

Course Name	Course Code	Credit	Year	Semester	Remark
Probability	CSIEB0130	3	2nd	Spring	
Computer Organization	CSIEB0140	3	2nd	Spring	
Programming Languages	CSIEB0150	3	2nd	Spring	
Computer Architecture	CSIEB0160	3	3rd	Fall	
Formal Languages and Automata	CSIEB0190	3	3rd	Spring	
Compiler Design and Implementation	CSIEB0200	3	3rd	Spring	
Undergraduate Project (I)	CSIEB0320	1	3rd	Fall	*Original name: Independent Study (I)
Undergraduate Project (II)	CSIEB0360	1	3rd	Spring	*Original name: Independent Study (II)
At least 1 course from below:					
Electronics (I)	CSIE@0190	3	2nd	Fall	
Electric Circuit Analysis (I)	CSIE@0200	3	2nd	Fall	
Electric and Electronic Circuits	CSIEB0090	3	2nd	Fall	
Important Note: * All CSIE students must complete a 1-year long Undergraduate Project to finish a graduate project, and then perform a stand-up presentation, exhibition, and demonstration at the end of the year.					

IV. The Professional Elective Programs (Specialized Modules of CSIE):

A. Program of Multimedia and Intelligent Computing (at least 21 credits are required to fulfill this module.

Course Name	Course code	Credit	Year	Semester	Remarks
Introduction to Image Processing	CSIEB0440	3	3 rd	Fall	Image Processing course group
Image Processing	CSIE52100	3	4 th	Spring	Image Processing course group (Graduate level)
Introduction to Digital Signal Processing	CSIEB0330	3	3 rd	Spring	Digital Signal Processing course group
Digital Signal Processing	CSIE57500	3	4 th	Spring	Digital Signal Processing course group (Graduate level)
Computer Vision	CSIEB0450	3	3 rd	Fall	Computer Vision course group
Advanced Computer Vision	CSIE54400	3	4 th	Spring	Computer Vision course group (Graduate level)
Introduction to Virtual Reality	CSIEB0340	3	3 rd	Fall	Virtual Reality course group
Virtual Reality	CSIE56000	3	4 th	Fall	Virtual Reality course group (Graduate level)

3D Computer Graphics on Game Development	CSIE@0160	3	3 rd	Fall	Computer Graphics course group
Advanced Computer Graphics	CSIE53300	3	4 th	Fall	Computer Graphics course group (Graduate level)
3D Game Engine Programming	CSIE@0220	3	3 rd	Spring	Computer Graphics system course group
Advanced Computer Graphics System Design	CSIE55400	3	4 th	Spring	Computer Graphics system course group (Graduate level)
Introduction to Artificial Intelligence		3	3 rd	Fall	Artificial intelligence course group
Artificial Intelligence	CSIE51600	3	4 th	Fall	Artificial intelligence course group (Graduate level)
Introduction to Bioinformatics		3	3 rd	Spring	Bioinformatics course group
Computational Biology	CSIE56200	3	4 th	Spring	Bioinformatics course group (Graduate level)
Introduction to Soft Computing	CSIEB0310	3	3 rd	Fall	Soft Computing course group
Realization of Soft Computing Systems	CSIE62080	3	4 th	Fall	Soft Computing course group (Graduate level)
Programming Multimedia APPs for Mobile Platforms	CSIEB0400	3	3 rd	Spring	Mobile Platforms course group
Smart Mobile Application Design	CSIE59800	3	4 th	Fall	Mobile Platforms course group (Graduate level)
Information Retrieval		3	3 rd	Fall	Information Retrieval course group
Advanced Information Retrieval		3	4 th	Spring	Information Retrieval course group (Graduate level)
Data Mining and Applications		3	4 th	Fall	Data Mining course group
Data Mining	CSIE@0240	3	3 rd	Fall	Data Mining course group (Graduate level)
Introductory Machine Learning	CSIEB0300	3	3 rd	Fall	Machine Learning course group
Machine Learning	CSIEM0170	3	4 th	Fall	Machine Learning course group (Graduate level)
Introductory Deep Learning	CSIEB0410	3	3 rd	Spring	Deep Learning course group
Foundation and Practice of Deep Learning	CSIEM0310	3	4 th	Spring	Deep Learning course group (Graduate level)
Introduction to data science	CSIEB0420	3	3 rd	Spring	Big Data Analytics course group
Introduction to Big Data Analytics		3	3 rd	Fall	Big Data Analytics course group
Big Data Analytics		3	4 th	Spring	Big Data Analytics course group (Graduate level)
Computer Game Architecture and Design	CSIEB0350	3	3 rd	Spring	
Multimedia Systems	CSIE@0140	3	3 rd	Spring	

Important Notes:

1. Up to 6 credits are transferable into this program.

For CSIE students: any CSIE elective classes are allowed to transfer into this program.

For students of other departments: any courses offered by the CSIE elective programs, Introduction to Computer Programming (I), and/or Data Structures classes are allowed to transfer into this program.

Please note: Courses of the same names but intended for non-major students are not allowed to transfer.

2. Only 1 course from the same course group can be counted as the required credits of the program, although all credits are counted for graduation. Students must decide where the course credits will be counted. If graduate-level courses are counted for undergraduate programs or for graduation, they cannot be counted again for the master programs.

3. For undergraduate students: when studying a graduate-level course with the same name course in this program, even though it is offered in different graduate programs (e.g. master, executive-master, doctoral), is deemed as the same course

B. Program of Network and System (at least 21 credits are required to fulfill this module)

Course	Course code	Credit	Year	Semester	Remarks
Introductory VLSI Design	CSIEB0370	3	3 rd	Fall	VLSI design course group
Application-Specific Integrated Circuits Design	CSIE56700	3	4 th	Fall	VLSI design course group (Graduate level)
Introduction to Embedded System Design	CSIEB0380	3	3 rd	Spring	Embedded system design course group
Software Development for Embedded Systems	CSIE58100	3	4 th	Fall	Embedded system design course group (Graduate level)
Wireless Networks	#000017700	3	3 rd	Spring	Wireless networks course group
Wireless Internet	CSIE58400	3	4 th	Spring	Wireless networks course group (Graduate level)
Computer Networks	CSIEB0280	3	3 rd	Fall	Computer networks course group
Computer Networks and Communications	CSIE52500	3	4 th	Fall	Computer networks course group (Graduate level)
Introduction to Information Security Management System	CSIE@0190	3	3 rd	Fall	Information security management system course group
Information Security Management System	CSIE62050	3	4 th	Spring	Information security management system course group (Graduate level)
Introduction to Parallel Computing	CSIE@0200	3	3 rd	Fall	Parallel computing course group
Parallel Computing	CSIE61600	3	4 th	Fall	Parallel computing course group (Graduate level)
Introduction to Cloud Computing	CSIE@0210	3	4 th	Fall	Cloud computing course group
Cloud Computing	#000017800	3	4 th	Spring	Cloud computing course group (Graduate level)
Graph Theory	CSIE@0170	3	3 rd	Spring	Graph theory course group
Advanced Graph Theory	CSIE54800	3	4 th	Spring	Graph theory course group (Graduate level)
Software Engineering	CSIEB0430	3	3 rd	Spring	
Information Security	CSIEB0240	3	3 rd	Fall	
Network Programming Design	CSIE@0220	3	3 rd	Spring	
Internet Protocols	CSIEB0390	3	3 rd	Spring	
System Programming	CSIEB0260	3	4 th	Fall	
Advanced Computer Programming		3	3 rd	Spring	
Database Systems	CSIEB0290	3	4 th	Fall	
XML Design and Applications	CSIEB0250	3	4 th	Fall	
Internet System Design and Practice	CSIEB0270	3	3 rd	Spring	*** see note below ***
Special Topics on System-on-Chip Design	CSIE58000	3	4 th	Fall	Graduate level
Advanced Computer Architecture	CSIE50300	3	4 th	Spring	Graduate level
LoRaWAN program design and service		3	4 th	Spring	Graduate level
Important Notes: 1. Up to 6 credits are transferable into this program. For CSIE students: <u>any CSIE elective classes</u> are allowed to transfer into this program. For students of other departments: any courses offered by the CSIE elective programs, Introduction to Computer Programming (I), and Digital Logic Design classes are allowed to transfer into this program.					

Please note: Courses of the same names but intended for non-major students are not allowed to transfer.

2. Only 1 course from the same course group can be counted as the required credits of the program, although all credits are counted for graduation. Students must decide where the course credits will be counted. If graduate-level courses are counted for undergraduate programs or for graduation, they cannot be counted again for the master programs.

3. For undergraduate students: when studying a graduate-level course with the same name course in this program, even though it is offered in different graduate programs (e.g. master, executive-master, doctoral), is deemed as the same course.

*** For Internet System Design and Practice class: Students are recommended to take the Introduction to Computer Programming (I) and the Introduction to Computer Programming (II) before taking this class ***