

靜宜大學 理學院國際碩士產學專班介紹

Introduction of the International Master INTENSE Program in the College of Science

1. Introduction of Providence University:

Providence University is a Catholic Institution which was founded in 1956. Now, there are 11,000 students and 10% of our students are international students comes from more than 35 different countries and cultures.

In response to the recent acceleration of digitalization and globalization, we are striving to develop excellent human resources who have the ability to think independently as well as human resources who can passionately contribute to society.

2. Program Features (Master Program which is taught in English):

The College of Science has established a new specialized program to meet the talent needs of domestic industries. This program involves the signing of **industry-academia cooperation agreements between the university and enterprises, collaborative design of customized courses with the industry, joint teaching** by university faculty and industry experts, full participation of enterprises in selecting outstanding talents, course instruction, and internships, all aimed at jointly fostering and retaining talents.

3. Institution: College of Science / Master Program

4. Period of Study: 2 years

(including 1 year on-campus courses and 1 year off-campus internship)

5. Curriculum Guideline:

(1) Course Language: Taught in **English**

(Entry requirement: TOEFL ITP 550 / IELTS 6.0 / TOEIC 700)

(2) Required Graduation Credits: 30 Credits

(3) Chinese language: Take Chinese course in the 1st year and pass **A2 Level of TOCFL** at least.

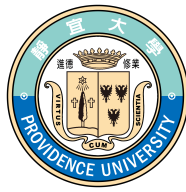
6. The Industry-Academic Scholarship for the INTENSE Program:

(1) Necessary administrative expenses for students' first arrival in Taiwan (receipt attached for the reimbursement, with a maximum of NTD. 10,000)

(2) One-way flight to Taiwan (a max. limit of NT\$9,000 for one-way ticket on direct flights)

(3) Tuition and miscellaneous fees (up to 2 years, with a max. limit of NT\$50,000 per semester)

(4) Monthly living allowance of NTD. 10,000 (up to 2 years)



7. **Application Deadline** for 2025 Spring Semester: **November 22nd, 2024.**

8. Contact Person for admission:

Miss June Yang, Director of International Students Affairs

Email: juneyang@gm.pu.edu.tw

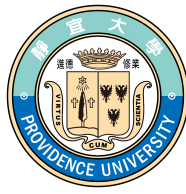
Tel: +886-4-26328001 ext. 11570

9. **Curriculum:**

Subject	Mandatory/ Elective
Colloquium 1 專題演講 (一)	Mandatory
Course Description	
Experts from various fields are invited to give lectures, which can guide students into different knowledge areas, helping to expand and enhance their professional skills, as well as to understand future industry trends and demands.	
Subject	Mandatory/ Elective
Colloquium 2 專題演講 (二)	Mandatory
Course Description	
Experts from various fields are invited to give lectures, which can guide students into different knowledge areas, helping to expand and enhance their professional skills, as well as to understand future industry trends and demands.	
Subject	Mandatory/ Elective
Industry Discussions 1 產業討論 (一)	Mandatory
Course Description	
The primary teaching objective of this course is to train students in the ability to gather and consolidate information on different industry topics. At the same time, it also helps develop students' oral presentation and reporting skills.	
Subject	Mandatory/ Elective
Industry Discussions 2 產業討論 (二)	Mandatory
Course Description	
The primary teaching objective of this course is to train students in the ability to gather and consolidate information on different industry topics. At the same time, it also helps develop students' oral presentation and reporting skills.	



Subject	Mandatory/ Elective
Internship 產業實習	Mandatory
Course Description	
This course is designed to offer students a way to connect theories with practices. And this course expects that students can experience the real operations of companies and realize how to apply theories to practices. Also, this course will help to build up the suitable attitude of working for the students. In addition, students can also make career exploration, and enrich themselves.	
Subject	Mandatory/ Elective
Internship Technical Report/Practical Thesis 實習技術報告/實作論文	Mandatory
Course Description	
Practical Thesis for the graduation requirement.	
Subject	Mandatory/ Elective
Industrial Basic Chemistry 產業基礎化學	Elective
Course Description	
The purpose of this course is to establish and learn foundational chemistry knowledge relevant to industry. It introduces basic concepts in chemistry, serving as a foundation for students to connect with industry-related courses.	
Subject	Mandatory/ Elective
Organic Chemistry 有機化學	Elective
Course Description	
The primary goal of this course is to build a foundation in organic chemistry. It covers the structure, nomenclature, isomers, and basic reaction types of organic compounds. The course also aims to strengthen both foundational and applied knowledge, linking theoretical training with practical applications to cultivate talents with both hands-on skills and professional expertise.	
Subject	Mandatory/ Elective
Polymer Material 高分子材料	Elective
Course Description	
The objective of this course is to illustrate the intrinsic properties, processing properties and the related article properties, including polymer mechanical and thermophysical properties, morphological, rheological and viscoelastic properties of polymers, and elastic and optical properties of polymers. Besides, this course also introduces and illustrates the synthesis polymerization and processing method, structure characterization, applied science and technology of commercial polymers, and to provide students to understand the development, usage, and	



control and management of these properties through recognition of the theoretic basis and the practices of polymers.

Subject	Mandatory/ Elective
Circular Economy 循環經濟	Elective

Course Description

The main objective of this course is to help students understand the concept of the circular economy, which is a regenerative system that aims to reduce, close, and narrow material and energy cycles. This approach minimizes resource input and waste output. The circular economy promotes a development model that balances economic activities, local employment, environmental ecology, and energy independence, with the ultimate goal of achieving sustainable development, zero waste, and a symbiotic relationship with the environment and resources we possess.

Subject	Mandatory/ Elective
Basic Electrical Engineering 基礎電學	Elective

Course Description

Basic electrical engineering is a fundamental course in the industry. In this course, students will learn the electrical principles of basic circuit components such as resistors, capacitors, and power sources, as well as the techniques for analyzing circuits composed of these components. The course covers the following topics: basic concepts of electrical engineering, voltage and current, resistance, series and parallel circuit analysis methods, capacitors and capacitance, capacitor charging and discharging, and circuits with simple waveforms.

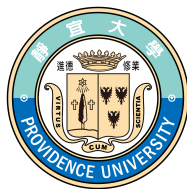
Subject	Mandatory/ Elective
Mechanical Design 機械設計	Elective

Course Description

The goal of this course is to design mechanical products by applying physical principles combined with knowledge of electronics and materials chemistry. The content ranges from the design of mechanisms, structures, materials, components, to circuits, integrating mechanics, material mechanics, and digital circuits. Various mechanical components and key design considerations that can be applied in the industry will be introduced.

Subject	Mandatory/ Elective
The introduction of Green Industry 綠色產業概論	Elective

Course Description



The green industry concept, also called environmental industry, has gradually replaced traditional industries on the basis of the concept of sustainable development. In traditional environmental management systems, waste disposal and both treatment and control of pollution are typically applied. However, cleaner production and industrial ecology are now commonly used in the production chain. Environmental policy can promote the development of the green industry concept. This report introduces the concept and its current development in Taiwan and other countries. The potential development of the concept, e.g., environmental markets, is also discussed herein.

Subject	Mandatory/ Elective
Introduction to Chemical Industry 化學工業概論	Elective

Course Description

This is a beginning course for the students of applied chemistry to understand the chemical industries. This course provides not only the basic knowledge of the physical and chemical principles involving in the chemical industries, but also an understanding toward the process steps required to produce chemicals from various raw materials. It has been designed as a basic discipline for students before joining the chemical industry.

Subject	Mandatory/ Elective
Energy Technology 能源科技	Elective

Course Description

The contents of this course are introduction of energy and development of new green energy. For examples: wind, geothermal, biomass, fuel cell, various kinds of solar cells (first generation of solar cells, the second generation of solar cells, the third generation of solar energy batteries) ... and so on.

Subject	Mandatory/ Elective
Green Technology 綠色科技	Elective

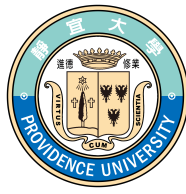
Course Description

1. Students will understand the principles of green chemistry, sustainable development goals (SDGs), and Net-Zero Emissions in 2050.
2. Students will learn green chemistry from artificial intelligence and computational chemistry perspectives.
3. The discussion issues in class include catalysis (heterogeneous, homogeneous, and single atom) and organic optoelectronic materials.

Subject	Mandatory/ Elective
Introduction to Special Chemicals	Elective



特用化學品	
Course Description	
Make students understand the specialty chemicals (Surfactants, Pigment & Dye and Functional Polymer), the content, the application and development.	
Subject	Mandatory/ Elective
Introduction to Industrial Pollution and Control 工業污染與防治概論	Elective
Course Description	
The major objective of this course is to guide the students to have the basic concepts of the industrial-pollution prevention through the introduction to the industrial pollutants and related regulations of management. To facilitate the protection for our environment and human health and to give impetus to the technologies about the pollution control in the education of the applied chemistry are the ultimate goals.	
Subject	Mandatory/ Elective
Applied Surface Chemistry 應用界面科學	Elective
Course Description	
The goal of this course is to provide a narrow bridge between the basic, theoretical aspects of surfactant science and the less well defined and more empirical world of its application, it is necessary to make many compromises as to the material included and the way in which it is presented.	
First the course includes some historical and economic information covering the development and application of surfactants, and an introduction to some key terms and conventions. The chemistry and synthesis of surfactants will be introduced. The surface properties of adsorption and micellization of surfactants will be discussed. The other properties of surfactants -- surface tension reduction, wetting, emulsification, dispersing, foaming and detergency will be introduced by experimental results.	
Subject	Mandatory/ Elective
Environmental Analysis 環境分析	Elective
Course Description	
This course will teach students to understand the harm caused by environmental pollutants to ecosystems and human health. Students will also learn how to use professional knowledge to detect harmful pollutants, as well as methods for air pollution prevention and wastewater treatment. Additionally, significant pollution events that have occurred in the past and pollution incidents in daily life will be introduced. Through the course discussions, it is hoped that students will combine environmental protection concepts with professional knowledge and apply them in the industry.	



10. Internship Information:

Company 1 (STEM)	Yuen Foong Yu Consumer Products Co. Ltd. (YFYCPG) 永豐餘消費品實業股份有限公司	
Position	Process Engineer: 1	Mechanical maintenance, process design, and administrative documents management.
Position	Production Line Reserve Management Trainee: 2	Mechanical and electrical maintenance, production line management
Company 2 (STEM)	U-CAN Dynatex Inc. 優肯科技股份有限公司	
Position	Assembly and After-Sales Service Engineer: 1	Mechanical assembly, electrical drawing recognition, and administration documents management.
Company 3 (STEM)	高林國際企業有限公司 KAO LIN International Co., Ltd	
Position	Engineer: 2	Mechanical technology management, material identification and management of foreign employees.
Company 4 (STEM)	Advanced and Good Material Corp. 先進固特材料有限公司	
Position	Engineer: 2	Polymer chemical synthesis, detection instrument operation (TEM, SEM, XRD, GPC, FTIR), organic synthesis, operation of 3D printing equipment
Company 5 (STEM)	YFY Packaging Inc. 永豐餘工業用紙股份有限公司	
Position	Process Engineer: 1	Process system analysis and improvement, operation efficiency improvement. ❖ Entry level of TOCFL is A2 (listening and reading). ❖ Students need to reach B1 level of TOCFL in 2 nd year.
Position	Field Engineer: 1	Mechanical and electrical maintenance, Industry 4.0 smart manufacturing (PLC and other programming). ❖ Entry level of TOCFL is A2 (listening and reading). ❖ Students need to reach B1 level of TOCFL in 2 nd



		year.
Position	Energy Engineer: 1	Energy conversion, air/water/waste related licenses. ❖ Entry level of TOCFL is A2 (listening and reading). ❖ Students need to reach B1 level of TOCFL in 2 nd year.