Curriculum of the Bachelor Program at the Department of Chemical and Materials Engineering, Chang Gung University
(For students admitted in Fall, 2025)

	Course Title	Year 1		Course Title	Year 2			Course Title	Year 3			SUBJECT	Year 4	
		1Semes.	2Semes.		1Semes.	2Semes.	Summer		1Semes.	2Semes.	Summer		1Semes.	2Semes.
Departmental Required Courses	Calculus (I)(II)	3	3	Engineering Mathematics (I)(II)	3	3		Unit Operations and Transport Phenomena (I)	3			Process Design	3	
	General Physics (I)(II)	3	3	Physical Chemistry (I)(II)	3	3		Instrumental Analysis	3			Chemical reaction engineering Laboratory	1	
	General Chemistry (I)(II)	3	3	Materials Science and Engineering (I)(II)	3	3		Materials Engineering Laboratory (I)	1					
	General Chemistry Laboratory (I)(II)	1	1	Organic Chemistry (I)	3			Physical Chemistry Laboratory	1					
	Introduction of Chemical and Materials Engineering	2		Experimental Organic Chemistry		1		Chemical reaction engineering		3				
	Computer Programming	3		Physical Education (I)(II)	0	0		Chemical Engineering Laboratory (I)		1				
	Material and Energy Balances		3					Instrumental Analysis Laboratory		1				
	Physics Laboratory		1					Directed Research (I)	1					
	Physical Education (I)(II)	0	0											
Chemical Engineering Track				Organic Chemistry (II)		3		Thermodynamics	3			Chemical Engineering Laboratory (II)	1	
								Process Control		3				
								Unit Operations and Transport Phenomena (II)		3				
Materials Engineering Track				Electronic Materials		3		Material Engineering Thermodynamics	3			Materials Engineering Laboratory (II)	1	
								The Basics of Crystallography and Diffraction		3				
								Calculation for Materials		3				
Subtotal		15	14		12	13			12	11			5	0
Required Courses for Advanced Process Design				Industrial Internship			4	Plant Operation Practice			3			
				Statistics			1	Computer-Aided Plant Design			4			
Elective Courses for Advanced Process Design Program				Engineering Drawing	2			PCB Engineering and Practice – Rigid Board			2	Instrumentation and Control System Design	3	
								PCB Engineering and Practice – Flexible Board			2	Chemical Process Simulation Practice		3
								Smart Manufacturing Engineering and Practice			3			
Core Electives	Precalculus and its applications (I)(II)	1	1					Directed Research (II)		1		Directed Research (III)	1	
								Bachelor Thesis (I)		0		Bachelor Thesis (II)	2	
								Overseas Study		1		Overseas Study	1	
												Off-Campus Internship	4	
												Special Lecture in Practice of Chemical Industry	3	
College Interdisciplinary Courses								English Speaking and Presentation(I)	2					
								English Speaking and Presentation (II)		2				
Professional Electives in Three Major Fields — Green Process Engineering				Numerical Methods and Analysis	3			Environmental Engineering (I)	3			Instrumentation and Control System Design	3	
				Engineering Statistics	3			Environmental Engineering (II)		3		Electrochemistry	3	
				Environmental Policies and Technologies	3							Applied Mathematics for Chemical Engineering	3	
				Industrial Safety and Health		3						Transport Phenomena & Unit Operation (III)	3	
												Advanced Process Control		3
												Theory and Practice of Supercritical Fluids		3
												Chemical Process Simulation Practice		3
Materials Technology				Introduction to Nanomaterials	3			Polymer Chemistry	3			Ceramic Materials	3	
				Synthesis and Applications of Nanopowders		3		Solid State Materials		3		Biomedical Materials	3	
				Battery Materials and Analysis Practice	3			Optoelectronic Materials	3			Physical Metallurgy	3	
								Polymer Physics		3		Introduction to Energy Technology	3	
								Battery Assembly and Analysis Practice	3			Advanced Semiconductor Equipment	3	
												Photovoltaic Technology		3
												Lecture on Lithium Battery Industry Practice		3
Biotechnology				Biotechnology	3			Biochemistry	3			Industrial Applications of Microorganisms	3	
								Special Topics of Biotechnology		3		Introduction to Biochemical Engineering	3	
												Medical Applications of Nanobiotechnology	2	

Remarks

1. Graduation Credits: 128 credits.
(1)Required Credits: 82 credits.
(2)Elective Credits: 21 credits.
①Department electives must account for at least 18 credits. Professional electives are divided into three major fields: "Green Process Engineering," "Materials Technology," and "Biotechnology."
- In the Chemical Engineering Track, at least 5 courses must be selected from the "Green Process Engineering" and "Biotechnology" fields, with Transport Phenomena and Unit Operations (III) being a mandatory course.
- In the Materials Engineering Track, at least 5 courses must be selected from the "Materials Technology" field, with Physical Metallurgy being a mandatory course.
- The Bachelor Thesis and Undergradudate Research cannot be taken simultaneously.
②A maximum of 3 elective credits from other departments can be accepted (Physical Education and National Defense Education Military Training electives are excluded).
③Interdisciplinary electives offered by the college are counted as electives from other departments.
(3)General Education Credits: Please refer to the regulations of the General Education Center. A total of 25 credits are required in the areas of Holistic Development, English Proficiency, Core Courses, and Diverse Courses.
2.Physical Education: Physical Education in the first and second years is required but worth 0 credits. (The total of 128 credits required for graduation does not include Military Training and Physical Education credits.)
3.The university has an English proficiency graduation requirement. Students must meet the university's standard in order to graduate. Please refer to the regulations of the Language Center.
4.Students applying for the Advanced Process Design Program may select required courses from the program to substitute for department-required courses listed in gray.
5.Advanced Process Design Program: Required credits = 12 credits, Elective credits = 5 credits.
6.If the Advanced Process Design Program is not completed:
＊Plant Operation Practice can be used to replace Process Design. ＊Other course credits will be counted as Green Process Engineering field professional elective credits.
7.Overseas Study Program: Students must complete an overseas exchange program before they can select the Overseas Study course.

系主任簽章：_____ 2025-10-27