

[illegible]

Course	Credits	Hours	1 <sup>st</sup> year				2 <sup>nd</sup> year				3 <sup>rd</sup> year				4 <sup>th</sup> year				Note
			Fall		Spring		Fall		Spring		Fall		Spring		Fall		Spring		
			class	lab	class	lab	class	lab	class	lab	class	lab	class	lab	class	lab	class	lab	
Laws, Standards, and Academic Ethics on Biotechnology	2	2			2														
Freshman Seminar	1	1	1																
Analytical Chemistry(Lab)	3	3					3												
Biochemistry-1	4	4					4												
Biochemistry Lab.-1	1	3					1	2											Service Learning
Biochemistry-2	4	4							4										
Microbiology	3	3							3										
Microbiology Lab.	1	3							1	2									
Cell Biology	3	3									3								
Cell Biology Lab.	1	3									1	2							
Bioinformatics-1	2	3											2	1					Computer courses
Molecular Biology	3	3									3								
Biostatistics	3	3									3								
Laboratory Quality Management System	3	3											3						
Research Training 1	1	1											1						
Research Training 2	1	1													1				alternative courses: Internship in Industry

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				class	lab	class	lab	class	lab	class	lab	class	lab	class	lab	class	lab	class	lab		
	Seminar 1	1	1													1	0				
	Seminar 2	1	1															1	0		
	Subtotal	61																			
	Subtotal Required Course Credits	89																			
Professional Elective Courses	Biomedical Program	Animal Physiology	3	3					3												
		Animal Cell Culture and Application	2	2							2										
		Immunology	3	3									3								
		Vaccine & Vaccination	3	3											3						
		Laboratory Animal Medicine	3	3															3		
		Gene Transfer	2	2															2		
		Virology	3	3													3				
		Genomics	3	3								3									
		Molecular genetics and applications	3	3					3												
		Special Topics to Genome Project & Annotation	3	3								3									
		Introduction to Pharmacy	3	3					3												
		Bioinorganic Chemistry	3	3										3							
		Applied Bioinstrumentation and Analysis	3	3										3							
		Bioinformatics-2	2	3													2	1			Computer courses
		Special Topics in Molecular Biology	3	3												3					

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					class	lab	class	lab	class	lab	class	lab	class	lab	class	lab	class	lab	class	lab	
		Proteomic technology application	3	3											3						
		Developmental and stem cell biology	3	3											3						
		Protein Separation and Two Dimensional Electrophoresis	2	2													2				
		Protein preparation and mass spectrum analysis	2	2															2		
Biofood Program	Nutrition	3	3						3												
	Introduction to Biochemistry Engineering	3	3						3												
	Plant Physiology	3	3						3												
	Cosmetics Science	3	3						3												
	Herb Plant Cultivation and Application	3	3						3												
	Nutrition (E)	3	3							3											
	Food Chemistry	3	3							3											
	Food Analysis (Lab)	3	3							3											
	Tissue culture and Application	3	3							3											
	Environmental Ecology	3	3							3											
	Food Microbiology (Lab)	3	3									3									

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			class	lab	class	lab	class	lab	class	lab	class	lab	class	lab	class	lab	class	lab	
Agriculture and Food Industrial Waste Management	2	2										2							
The Principle and Practice of Aquaponics	3	3										3							
Enzymology	3	3												3					
Food Safety	3	3												3					
Fermentation	3	3												3					
The Science and Culture Behind Food Material	3	3												3					
Food Process (Lab)	3	3														3			
Dietary Supplements and Functional Foods	3	3														3			

以上專業選修學程至少需修 20 個學分 Professional electives must be selected at least 20 credit hours

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	General Biology Lab.-2	1	3							1	2								
	Bioorganic Chemistry	2	2					2											
	Biotechnology Law	2	2							2									
	Ecology	2	2									2							
	International Biotech Industry											2							
	Research Paper Writing	1	1											1					
	Internship in Industry	1	1												1				
	Biosensor	3	3												3				
	Biotechnical Intellectual Property Rights and Patents	2	2												2				
	Introduction of Bioindustry	2	2												2				
	Physic Chemistry	3	3												3				
	Subtotal Required Course Credits	89																	
	Subtotal Elective Course Credits	39																	
	Subtotal Professional Elective Course Credits	20																	
	Subtotal Elective courses from other schools	19																	
	Grand Total	128																	

## Notes:

1. In accordance with the General Provisions for Study, undergraduate students need to meet the university-wide basic competencies of English, Information Technology, Chinese, and Sports, and pass the core competencies of their department to be eligible for graduation.
2. Among the 12 university-designated required General Education credits, students must take one course from the Core Courses in the three areas: " Humanities," " Social Sciences," and " Natural Sciences " (2 credits each), and one course from the Interdisciplinary Exploration course group in the newly established " Interdisciplinary Exploration and Self-directed study" area (3 credits). In total, students must take 4 courses. and accumulating 9 credits. Students must select 2 elective courses from the Extended Courses in the " Humanities," " Social Sciences," and " Natural Sciences " areas, and the self-directed study courses under the “Interdisciplinary Exploration and Self-directed study” area. These 2 courses must not be from the same area, and at least 3 credits in total.
3. Elective credits of the other departments are, at most, 19 credits. Course credits from the "Teacher Education Program" of the Teacher Education Center can be counted toward students' final grades, and can be applied retroactively to students who entered the university before the 2025-2026 academic year.
4. Students can choose the course (E) from BT, which can be counted as their graduation credits under the approval of the department chair, can be included in the elective credits of the department, and can be applied retroactively to students who entered the university before the 2025-2026 academic year.

- 5.The newly added elective courses in this academic year can be applied retroactively to students who entered the university prior to the 2025-2026 academic year.
- 6.When taking and retaking professional courses, students can choose the same course name, the same course name (E), or the same course content as substitutions under the approval of the department chair. These courses can be regarded as graduation credits and applied retroactively to students who entered the university before the 2025-2026 academic year.
- 7.Students can choose the course from BT master program, which can be counted as their graduation credits under the approval of the department chair, can be included in the elective credits of the department, and can be applied retroactively to students who entered the university prior to the 2025-2026 academic year.
- 8.Professional Electives can be selected from two programs of study, students must complete one of the study programs, consisting of at least 15 course credits.
- 9.Professional electives must be selected at least 20 credit hours.
- 10.When retaking the Calculus course, students can choose Calculus I or 2 course as substitutions under the approval of the department chair. These courses can be regarded as their graduation credits, and can be applied retroactively to students who entered the university prior to the 2025-2026 academic year.
- 11.The credits of interdisciplinary focused course program are not included in course structure diagram that can be regarded as the other department credits.
- 12.The required courses on this Course Outline may be counted as elective course credits toward total graduation credits by students who entered the university prior to the 2025-2026 academic year.
- 13.Graduating students and students in the extended study period who did not pass required courses of Physical Education can waive a maximum of two (2) required Physical Education courses by passing Comprehensive Physical Education I, Comprehensive Physical Education II. This regulation is applicable for those admitted in and prior to 2020-21 academic year.
14. Research Project II and Internship in Industry are optional courses. Students who conduct the type of Research Project I could take the Research Project II continuously or take the Internship in Industry. Both ways will be acceptable for graduation criteria.
15. Foreign students, overseas Chinese students, Hong Kong students and Macao students may select the following courses to waive "Chinese Literature: Appreciation and Creative Writing I and II" once the related test confirms that they have insufficient Chinese ability: "Basic Mandarin I and II" or "Chinese Literature I and II". This may also be retroactively applied to students who entered the university prior to the 2023-24 academic year.
16. Freshman and sophomore students in all undergraduate programs who meet the criteria outlined in the “Ming Chuan University Guidelines for Waiver from Required English Courses” may apply for exemption from the corresponding required English course and instead enroll in an equivalent advanced English course. Undergraduate students who have not met the English proficiency requirement as specified in the “Ming Chuan University English Proficiency Guidelines” before graduation must take and pass a zero-credit “English Proficiency” course offered by the English Language Center. Passing this course will be considered equivalent to meeting the English proficiency requirement.

