化材系 碩士班 113學年度入學課程結構規劃表

National Kaohsiung University of Science and Technology

Department of Chemical and Materials Engineering, College of Engineering

Curriculum of Master Program in Academic Year 2024

課程類別			一年級1st academic year (Y1)						二年級2nd academic year (Y2)					
			第一學期Semester 1			第二學期Semester 2			第一學期Semester 1			第二學期Semester 2		
			課程名稱 courses	學分 credit	時數 hour	課程名稱 courses	學分 credit	時數 hour	課程名稱 courses	學分 credit	時數 hour	課程名稱 courses	學分 credit	時數 hour
必修 Required courses		應修學分數 11學分 11 credits of requirement	專題研討(一) Seminar (1)	1	2	專題研討(二) Seminar (2)	1	2				論文 Master Thesis	6	
						科技英文 Technical English writing	3	3						
	特用化學品領域 Specialty Chemicals		特用化學品特論 Specialty Chemicals	3	3	界面化學特論 Selected Topics of Surface Chemistry	3	3	特用合成樹脂 Special Synthetic Resin	3	3	光電特用化學品技術 Optical Technology Specialty Chemicals	3	3
			高等有機化學 Advanced Organic Chemistry	3	3	有機分析 Analysis of Organic Chemistry	3	3	界面活性劑製程 Manufacturing Process of Surfactant	3	3	生醫特用化學品 Bio Specialty Chemicals	3	3
			有機合成 Synthesis of Organic Chemistry	3	3	特用化學品製造程序 Specialty Chemicals Manufacturing Process	3	3				凝膠技術與應用 Colloid Technology and Applications	3	3
			溶凝膠及粉體技術 Sol-Gel Science and Powder Technology	3	3	化妝品化學實務 Cosmetics Practice	3	3						
			工業化學特論 Selected Topics in Industrial Chemistry	3	3	界面科技與應用 Interfacial TechnologyI and Application	3	3						
			膠體與界面科學 Colloid and Surface Science	3	3									
	材料科技領域 Materials Technology		高分子材料 Polymer Materials	3	3	高分子分析技術 Polymer Characterization	3	3	高分子型態學 Polymer Morphology	3	3	超導體材料 Superconductor Materials	3	3
			功能性高分子材料 Functional Polymer Materials	3	3	高分子機械性質 Mechanical Properties of Polymer Materials	3	3	高分子流變學 Polymer Rheology	3	3	奈米材料特論 Selected Topics in Nano-materials	3	3
			高分子結構與物性 Polymer Structure and Physical Properties	3	3	高分子加工與應用 Processing and Applications of Polymeric Materials	3	3	真空薄膜工程 Thin-Films Engineering	3	3	材料表面處理特論 Selected Topics on Surface Treatment of Materials	3	3
			擴散理論 Diffusion Theory	3	3	高分子物理化學 Physical Chemistry of Polymer	3	3	半導體理論與製程 Manufacturing Process of Semiconductor	3	3	IC元件電漿製程 Plasma Processing for Ic Manufacturing	3	3
			結晶化學 Crystallography Chemistry	3	3	電子陶瓷材料 Electronic Ceramics	3	3	表面科學與分析 Surface Science and Analysis	3	3	光學高分子材料 Optical Optoelectrical Polymeric Materials	3	3
			有機光電材料特論 Selected Topics on Organic Optoelectronic Materials	3	3	X-ray繞射學 X-Ray Diffraction	3	3	薄膜製程特論 Selected Topics on Fabrication of Ceramic Film	3	3	陶瓷薄膜製程特論 Selected Topics on Fabrication of Ceramic Films	3	3
			電子顯微鏡學 Electron Microscopy	3	3	陶瓷材料 Ceramics	3	3	光電材料特論 Selected Topics of Optical-Electrical Materials	3	3			
			光電高分子材料特論 Selected Topics of Polymer Optoelectronic Materials	3	3	陶瓷製程特論 Selected Topics of Ceramic Processing	3	3	材料製程之固化現象與理論 Solidification Phenomena and Priniples in Materials Processing	3	3			
			薄膜材料學 Thin Films Materials	3	3	半導體構裝材料與製程特論 Selected Topics of Assembly and Fabrication of Semiconductor Materials	3	3						
			高等複合材料 Advanced Composite Materials	3	3	小角度X光繞射學 Small Angle X-Ray Diffraction	3	3						
			導電性高分子材料 Conducting Polymer Materials	3	3	薄膜材料特論 Selected Topics of Thin Films	3	3						

專業課程	選修 Elective courses		應修學分數 23學分 23 credits of elective courses			顯微技術分析 Characterigation of Materials	3	3							
						電漿原理 Principle of Plasmon Theory	3	3							
						材料檢測技術 Analytical Technique of Material	3	3							
						固態化學 Solid State Chemistry	3	3							
		化工製程領域 Chemical Process		高等輸送現象與單元操作 Advanced transport Phenomena and Unit Operation	3	3	高等程序控制 Advanced Process Control	3	3	程序設計特論 Selected Topics on Process Design	3	3	製程系統工程 System Engineering of Manufacturing Process	3	3
				高等熱力學 Advanced Thermodynamics	3	3	相平衡 Phase Equilibria	3	3	製程整合與電腦輔助設計 Computer Aided Design and Manufacture	3	3			
				觸媒化學特論 Selected Topics of Catalytic Chemistry	3	3	統計與實驗設計 Statistical and Design of Experiments	3	3						
							高等反應工程 Advanced Chemical Reaction Engineering	3	3						
							高等數值分析 Advanced Numerical Analysis	3	3						
		電化學與能源科技領域 Electrochemical and Energy Technology		儲能元件 Energy Storage Devices	3	3	電化學感測器 Electrochemical Sensor	3	3	電化學防蝕技術 Corrosion Protection Technology	3	3	貴金屬電極材料處理技術 Technology of Precious Metal Electrode	3	3
				高等電化學 Advanced Electrochemistry	3	3	電化學合成及分析特論 Synthesis and Analysis For Electrochemistry	3	3	電池製作技術與發展 Development and Fabrication of Batteries	3	3	燃料電池特論 Selected Topics on Fuel Cells	3	3
				能源技術特論 Selected Topics on Energy Technology	3	3				電鍍技術特論 Selected Topics in Electrodeposition Technology	3	3			
				太陽能電池特論 Selected Topic of Solar Cells	3	3									
				電化學特論 Selected Topics in Electrochemistry	3	3									
				平面顯示器原理與應用 Principle and Application for Panel Display	3	3									
		環境科技領域 Environmental Technology		高等環境化學 Advanced Environmental Chemistry	3	3	廢水處理特論 Selected Topics of Waste-Water Treatment	3	3	毒性化學物質處理 Toxic Chemicals Substance Management	3	3	廢棄物處理特論 Selected Topics on Waste Treatment	3	3
				環境工程特論 Selected Topics on Environmental Engineering	3	3	空氣污染防治特論 Selected Topics of Air Pollution Control	3	3	環境毒物學 Environmental Toxicology	3	3	清潔生產特論 Selected Topics in Clean Production	3	3
				奈米環境工程技術特論 Selected Topics of Nanotechnology for Environmental Engineering	3	3	污染防治特論 Selected Topics on Pollution Control	3	3	高級淨水技術 Advanced Water Purification Technology	3	3	環境生物技術特論 Selected Topics of Environmental Biotechnology	3	3
				環境檢測 Environment Examination	3	3									
		生化科技領域 Biochemical Technology		生物技術特論 Selected Topics in Biotechnology	3	3	生化工程特論 Selected Topics in Biochemical Engineering	3	3	生化分離程序 Biochemical Separation process	3	3	生物感測器特論 Selected Topics of Biosensor	3	3
				微生物應用工業 Biological Industry	3	3									

		其他 others		暑期實習 Summer Internship	2	360	計算材料科學特論 Selected Topics of Computational Materials Science	3	3	專題研討(三) Seminar (3)	2	2	專題研討(四) Seminar (4)	2	2

I. Graduation requirements:

1. The minimal number of credit for graduation is 38 : (1) 13 credits of required courses (including Master thesis 6 credits) 、(2) 25 credits of elective courses (Up to 3 credits of the elective course by other department may be recognized)
2. Either "Advanced Chemical Reaction Engineering" or "Advanced Thermodynamics" can be chosen, and either "Technology of material examination" or "Nano Technology & Microstructure" can be chosen. Both of the course should be passed in order to graduate.
3. The Graduate students must take the seminar (3) and (4)，however，the students with an accelerated degree timeline could apply for the credits exemption after approval from the graduation affairs committee of the apartment，but the minimum graduation credits requirement must be completed.

II. Remarks:

1. This curriculum is valid as of the Academic Year2024
2. Elective courses: the courses will be offered based on practical needs.
3. International students who take English-taught courses not offered by this department or other schools (including online courses) may have these recognized as graduation credits with the approval of their supervising professor and submission of the professor's consent form. This will not be subject to the limitation on credits from other departments.
4. For other relevant regulations, please refer to guidelines on master's studies of the department (graduate institute).