

課程流水號 Serial Number	24014
課號 Course Number	LS3038
班次 Class	*
科目名稱(中文) Course Title(in Chinese)	奈米科技於免疫學的應用
科目名稱(外文) Course Title(In English or other languages)	Applications of nanotechnology for immunology
授課老師(中文) Instructor(in Chinese)	羅月霞
授課老師(外文) Instructor(In English or other languages)	Yueh-Hsia Luo
辦公時間(中文) Office Hour(in Chinese)	Thursday 13:00-15:00
辦公時間(外文) Office Hour(In English or other languages)	Thursday 13:00-15:00
課程目標(中文) Course Objective(in Chinese)	1. Understanding the basic concepts and applications of nanotechnology. 2. Comprehensive studies interactions between materials science and immunology. 3. Understanding the potential adverse effects of nanodrug on the immune system.
課程目標(外文) Course Objective(In English or other languages)	1. Understanding the basic concepts and applications of nanotechnology. 2. Comprehensive studies interactions between materials science and immunology. 3. Understanding the potential adverse effects of nanodrug on the immune system.
授課內容(中文) Course Description(in Chinese)	1.Immunology overview-innate immunity 2.Immunology overview-adaptive immunity 3.Physical-chemical properties of Nanomaterials 4.Interactions between nanomaterials and cells-I

	5.Interactions between nanomaterials and cells-II 6.Nanoparticles and immune system 7.Nanoparticles and innate immunity 8.Presentation/Oral Exam 9.Effects of nanoparticles on TLR signaling of innate immunity-I 10.Effects of nanoparticles on TLR signaling of innate immunity-II 11.Effects of nanoparticles on innate immune cells 12.Nanoparticles and adaptive immunity 13.Effects of nanoparticles on T Cells. 14.Effects of nanoparticles on B Cells 15.Therapeutic approach of nanoparticles on immune system-I 16.Therapeutic approach of nanoparticles on immune system-II 17.Therapeutic approach of nanoparticles on immune system-III 18.Presentation/Oral Exam
授課內容(外文) Course Description(In English or other languages)	1.Immunology overview-innate immunity 2.Immunology overview-adaptive immunity 3.Physical-chemical properties of Nanomaterials 4.Interactions between nanomaterials and cells-I 5.Interactions between nanomaterials and cells-II 6.Nanoparticles and immune system 7.Nanoparticles and innate immunity 8.Presentation/Oral Exam 9.Effects of nanoparticles on TLR signaling of innate immunity-I 10.Effects of nanoparticles on TLR signaling of innate immunity-II 11.Effects of nanoparticles on innate immune cells 12.Nanoparticles and adaptive immunity 13.Effects of nanoparticles on T Cells. 14.Effects of nanoparticles on B Cells 15.Therapeutic approach of nanoparticles on immune system-I 16.Therapeutic approach of nanoparticles on immune system-II

	17.Therapeutic approach of nanoparticles on immune system-III 18.Presentation/Oral Exam
教科書/參考書(中文) Textbook/References(in Chinese)	Newest scientific papers in nanotechnology
教科書/參考書(外文) Textbook/References(In English or other languages)	Newest scientific papers in nanotechnology
自編教材比例 Self-compiled Textbook/References Proportion	100%
授課方式 Requirements	講授Lecture 研討Seminar
評量配分比重(中文) Grading(in Chinese)	Presentation/Oral Exam (20%)+ Presentation/Oral Exam (20%) +Attendance/participation (60%) =100%
評量配分比重(外文) Grading(In English or other languages)	Presentation/Oral Exam (20%)+ Presentation/Oral Exam (20%) +Attendance/participation (60%) =100%
課程所屬學制 Educational System	學士班(Undergraduate Programme)
課程領域 Course Domain	基礎學科 生物科技
跨系課程領域 Cross Department Course Domain	

強度指數 Overall Rating 系所核心能力 Core Competencies of Department	0	1				5	評量方式 Corresponding Assessments
	不 具 備 Zero	非 常 低 Very Low	2 低 Low	3 普通 Medium	4 高 High	非常 高 Very High	

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	不具備 Zero	非常低 Very Low	低 Low	普通 Medium	高 High	非常高 Very High	
基礎生物專業知識 Basic Biological Sciences	●	●	●	●	●	●	<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習 (Assignments) <input checked="" type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input type="checkbox"/> 實作/實驗 (Practices/Experiments) <input type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量 (Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評 (Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)

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	0 不 具 備 Zero	1 非 常 低 Very Low	2 低 Low	3 普通 Medium	4 高 High	5 非 常 高 Very High	
發掘問題及實驗能力 Question approaching and experimental skills	●	●	●	●	●	●	<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習 (Assignments) <input checked="" type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量 (Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評 (Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)

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邏輯分析 Logical thinking and analysis	●	●	●	●	●	●	<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習 (Assignments) <input checked="" type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input type="checkbox"/> 實作/實驗 (Practices/Experiments) <input type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量 (Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評 (Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)

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電腦應用 Computer application	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習 (Assignments) <input type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input type="checkbox"/> 實作/實驗 (Practices/Experiments) <input type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量 (Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評 (Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input checked="" type="checkbox"/> 無(No assessment)

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溝通技巧 Communication skills	●	●	●	●	●	●	<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習 (Assignments) <input checked="" type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量 (Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評 (Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)

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獨立思考與自我學習 Independent thinking and self-learning	●	●	●	●	●	●	<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習 (Assignments) <input checked="" type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input type="checkbox"/> 實作/實驗 (Practices/Experiments) <input checked="" type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量 (Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評 (Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)

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	不 具 備 Zero	非 常 低 Very Low	低 Low	普通 Medium	高 High	非 常 高 Very High	
團隊合作 Team work	●	●	●	●	●	●	<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習 (Assignments) <input type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input type="checkbox"/> 實作/實驗 (Practices/Experiments) <input type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量 (Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評 (Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input checked="" type="checkbox"/> 無(No assessment)

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	不具備 Zero	非常低 Very Low	低 Low	普通 Medium	高 High	非常高 Very High	
強度指數 Overall Rating 博雅通識 General knowledge	●	●	●	●	●	●	<input type="checkbox"/> 紙筆測驗/會考 (Test/Exam) <input type="checkbox"/> 作業練習 (Assignments) <input checked="" type="checkbox"/> 口頭報告/口試 (Presentation/Oral Exam) <input type="checkbox"/> 專題研究報告(書面) (Research Report(printed on paper)) <input type="checkbox"/> 實作/實驗 (Practices/Experiments) <input type="checkbox"/> 出席/課堂表現 (Attendance/Performance) <input type="checkbox"/> 學習檔案評量 (Portfolios Assessment) <input type="checkbox"/> 自我評量/同儕互評 (Self Assessment/ Peer Assessment) <input type="checkbox"/> 作品/創作展演 (Products/Creative Performance) <input type="checkbox"/> 其他(Others) <input type="checkbox"/> 無(No assessment)