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# ②图玄束至大學

# 教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	科學創造力教學	策略專題研究			學年/學期 Academic Year/Semester			
課程名稱(英文) Course Name in English	Teaching Strategy of Scientific Creativity in Science Education							
科目代碼 Course Code	SCE_71990	系級 Department & Year	博士	開課單位 Course-Offering Department	Course-Offering 教育身			
修別 Type	選修 Elective	學分數/時 Credit(s)/Hou			3.0/3.0			
授課教師 Instructor	/陳世文							
先修課程 Prerequisite								

### 課程描述 Course Description

This course aims to introduce the theory, environments, and evaluation of scientific creativity. Students learn innovative thinking, problem-solving, and interdisciplinary collaboration, which are expected to understand fostering creative culture and using tech tools for creativity. Successful cases are analyzed for practical insights, laying a foundation for future research and teaching in scientific creativity.

## 課程目標 Course Objectives

- 一、認識促進科學創造力之理論與研究方法。
- 二、了解並能應用提升科學創造力之策略。
- 三、培養熱心探究科學創造力及其議題的態度。

	条專業能力 Basic Learning Outcomes	課程目標與系專業能 力相關性 Correlation between Course Objectives and Dept.'s Education Objectives
A	具備科學教育專業理論發展與實踐之素養。To possess the capacity to develop and practice theories in science education	•
В	具備科學教育獨立研究素養。To possess the ability of independent study focusing on science education	•
С	具備科學教育的創新與問題解決素養。To possess creativity in science education and the ability of problem solving	•
D	具備國際學術交流之素養。To possess the ability of international academic exchanges	0
Е	具備科學教學專業素養。To possess the ability and professional knowledge in science education	0

圖示說明Illustration : ● 高度相關 Highly correlated ○中度相關 Moderately correlated

### 授課進度表 Teaching Schedule & Content

週次Week	內容 Subject/Topics	備註Remarks		
1	課程介紹Introduction	課程介紹Introduction		
2	教育中創造力的定義Definition of creativity in education	Patston, T. J., Kaufman, J. C., Cropley, A. J., & Marrone, R. (2021).		
3	制式與非制式科學學習的創造力Creativity across formal vs informal science learning	Martins Gomes, D., & McCauley, V. (2021).		

4	創造力與科學教育的關係The relationship of creativity and science education	Hetherington, L., Chappell, K., Ruck Keene, H., Wren, H., Cukurova, M., Hathaway, C., & Bogner, F. (2020).
5	國慶日National Day (Holiday)	國慶日National Day (Holiday)
6	20年科學創造力研究回顧Research Review of scientific creativity is the past 2 decades	Prahani, B. K., Rizki, I. A., Suprapto, N., Irwanto, I., & Kurtuluş, M. A. (2024).
7	台灣光復節 Taiwan Restoration Day (Holiday)	台灣光復節 Taiwan Restoration Day (Holiday)
8	高等教育中的創造力 Creativity in high education	Corrêa, R., & Mourão, L. (2025)
9	期中考(Mid-term exam)	期中考(Mid-term exam)
10	如何測量創造力 How to measure the creativity across domains	Agnoli, S., Corazza, G. E., & Runco, M. A. (2016).
11	科學創造力、推理、智力的區分 Distinguishing links among scientific creativity, reasoning, and intelligence	Sternberg, R. J., Todhunter, R. J., Litvak, A., & Sternberg, K. (2020).
12	批判性思考、自我效能、科學創造力 Critical thinking, self-efficacy, and scientific creativity STEM與科學創造力 STEM and scientific creativity	Qiang, R., Han, Q., Guo, Y., Bai, J., & Karwowski, M. (2020)
13	STEM與科學創造力 STEM and scientific creativity	Eroğlu, S., & Bektaş, 0. (2022).
14	ASET conference	ASET conference
15	科學創造力課程設計與實踐 1 Scientific creativity curriculum design and practice 1	Presentation and discussion
16	科學創造力課程設計與實踐 2 Scientific creativity curriculum design and practice 2	Presentation and discussion
17	2026 新年 New Year (Holiday)	2026 新年 New Year (Holiday)
18	自主學習 Self-directed learning 期末考(Final-term exam)	自主學習 Self-directed learning 期末考(Final-term exam)

教學策略 Teaching Strategies
✓ 課堂講授 Lecture ✓ 分組討論Group Discussion     參觀實習 Field Trip
其他Miscellaneous:
教學創新自評Teaching Self-Evaluation
創新教學(Innovative Teaching)
▼ 問題導向學習(PBL) ■ 團體合作學習(TBL) ■ 解決導向學習(SBL)
✓ 翻轉教室 Flipped Classroom
社會責任(Social Responsibility)
□ 在地實踐Community Practice □ 產學合作 Industy-Academia Cooperation
跨域合作(Transdisciplinary Projects)
■ 跨界教學Transdisciplinary Teaching ■ 跨院系教學Inter-collegiate Teaching
□ 業師合授 Courses Co-taught with Industry Practitioners
其它 other:

學期成績計算及多元評量方式 Grading & Assessments									
配分項目	配分比例	多元評量方式 Assessments							
Items	Percentage	測驗 會考	實作觀察	口頭 發表	專題 研究	創作 展演	卷宗 評量	證照 檢定	其他
平時成績(含出缺席) General Performance (Attendance Record)	20%			~	~				
期中考成績 Midterm Exam	30%			~					
期末考成績 Final Exam	30%	~							
作業成績 Homework and/or Assignments	20%				<b>~</b>		<b>~</b>		
其他 Miscellaneous									

評量方式補充說明

Grading & Assessments Supplemental instructions

#### 教科書與參考書目(書名、作者、書局、代理商、說明)

Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

Agnoli, S., Corazza, G. E., & Runco, M. A. (2016). Estimating creativity with a multiple-measurement approach within scientific and artistic domains. Creativity Research Journal, 28(2), 171 - 176. Corrêa, R., & Mourão, L. (2025). Creativity in higher education: A systematic literature review. International Journal of Educational Research, 132, 102613.

Eroğlu, S., & Bektaş, O. (2022). The effect of 5E-based STEM education on academic achievement, scientific creativity, and views on the nature of science. Learning and Individual Differences, 98, 102181.

Hetherington, L., Chappell, K., Ruck Keene, H., Wren, H., Cukurova, M., Hathaway, C., Sotiriou, S., & Bogner, F. X. (2020). International educators' perspectives on the purpose of science education and the relationship between school science and creativity. Research in Science & Technological Education, 38(1), 19-41.

Martins Gomes, D., & McCauley, V. (2021). Creativity in science: A dilemma for informal and formal education. Science Education, 105(3), 498-520.

Patston, T. J., Kaufman, J. C., Cropley, A. J., & Marrone, R. L. (2021). What is creativity in education? A qualitative study of international curricula. Journal of Advanced Academics, 32(2), 207-230.

Prahani, B. K., Rizki, I. A., Suprapto, N., Irwanto, I., & Kurtuluş, M. A. (2024). Mapping research on scientific creativity: A bibliometric review of the literature in the last 20 years. Thinking Skills and Creativity, 52, 101495.

Qiang, R., Han, Q., Guo, Y., Bai, J., & Karwowski, M. (2020). Critical thinking disposition and scientific creativity: The mediating role of creative self-efficacy. The Journal of Creative Behavior, 54(1), 90-99.

Sternberg, R. J., Todhunter, R. J. E., Litvak, A., & Sternberg, K. (2020). The relation of scientific creativity and evaluation of scientific impact to scientific reasoning and general intelligence. Journal of Intelligence, 8(2), 17.

### 課程教材網址(含線上教學資訊,教師個人網址請列位於本校內之網址)

Teaching Aids & Teacher's Website(Including online teaching information.

Personal website can be listed here.)

https://ldrv.ms/f/c/6d9880be5ba09de1/Ejo22WHJ3ZBItwqDqNpKIRoBaZveNoSvF\_1LNXBLeDj8DA?e=9eMK8W

#### 其他補充說明(Supplemental instructions)