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國立東華大學

教學計劃表　Syllabus

課程名稱(中文) Course Name in Chinese	科學教育研究方法論			學年/學期 Academic Year/Semester	112/2
課程名稱(英文) Course Name in English	Research Methodology in Science Education				
科目代碼 Course Code	SCE_71700	系級 Department & Year	博士	開課單位 Course-Offering Department	教育與潛能開發學系
修別 Type	必修 Required	學分數/時間 Credit(s)/Hour(s)	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 introduces key research methods in science education, covering quantitative and qualitative approaches, as well as literature analysis. Students will learn questionnaire and experiment design, data analysis, qualitative research theories, participant selection, and data collection techniques. The course also focuses on scientific education paper writing skills and analyzing foreign scientific education papers. By the end, students will be capable of independently conducting research in science education, including method design, data analysis, and writing research reports.

課程目標　Course Objectives

本課程目標為協助學生瞭解科學教育研究法質性與量化研究之理論與實務，並透過閱讀科學教育相關之中英文期刊論文，剖析其使用的研究方法。

	系專業能力 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	
B	具備科學教育獨立研究素養。To possess the ability of independent study focusing on science education	
C	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	
E	具備科學教學專業素養。To possess the ability and professional knowledge in science education	

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	Introduction of the course	content and objectives description and assignments grouping
2	course content discussion	group discussion
3	Paradigms in Science Education Research	Chapter 1 of Lederman, et. al.

4	Quantitative Research Designs and Approaches (I)	Chapter 2 of Lederman, et. al.
5	Quantitative Research Designs and Approaches (II)	Chapter 2 of Lederman, et. al.
6	Qualitative Research as Culture and Practice	Chapter 3 of Lederman, et. al.
7	Take one week off	
8	Qualitative Research Methods for Science Education	Chapter 93 of Fraser, et. al.
9	期中考試週 Midterm Exam	
10	Quantitative Research Method: thesis review	Thesis Select, Review, and Report
11	Qualitative Research Method: thesis review	Thesis Select, Review, and Report
12	Quantitative Methodology Review on the Chinese Journal Paper of Science Education	Chinese journal paper select, review, and report
13	Quantitative Methodology Review on the Chinese Journal Paper of Science Education	Chinese journal paper select, review, and report
14	Quantitative Methodology Review on the English Journal Paper of Science Education	English journal paper select, review, and report
15	Qualitative Methodology Review on the English Journal Paper of Science Education	English journal paper select, review, and report
16	Research Framework and Methodology Report (1)	Personal Research Report
17	Research Framework and Methodology Report(2)	Personal Research Report
18	期末考試週 Final Exam	

教 學 策 略 Teaching Strategies

- [x] 課堂講授 Lecture
- [x] 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)
- [x] 團體合作學習(TBL)
- [x] 解決導向學習(SBL)
- [ ] 翻轉教室 Flipped Classroom
- [ ] 磨課師 Moocs

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)

- [x] 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 Items	配分比例 Percentage	多元評量方式 Assessments							
		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	20%				✓				
期末考成績 Final Exam	30%				✓				
作業成績 Homework and/or Assignments	30%		✓						
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.)

上課教材
Lederman, N. G., Zeidler, D. L., & Lederman, J. S. (2023). Handbook of Research on Science Education. Volume III. New York, NY: Routledge.

補充教材
Fraser, B. J., Tobin, K. G., McRobbie, C. J. (2012). Second International Handbook of Science Education. New York, NY: Springer.

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://drive.google.com/drive/folders/1IVOMSZ6Gf1ntinHw2T1GymUqOJBFvZo-?usp=sharing

其他補充說明 (Supplemental instructions)