國立屏東大學國際暨創新學院 110 學年第 1 學期第 2 次
院務會議、課程委員會議暨教師評審委員會紀錄

時間：110 年 10 月 25 日(星期一)下午 2 時整

地點：Google Meet 線上會議

主席 ：施百俊 院長

出席者：如簽到簿　　紀錄：雲永仁

壹、主席致詞：謝謝各位師長出席本次會議，今日議案再請各位師長給予指教。

貳、工作報告：

一、 宣讀 110 學年第 1 學期第 1 次(110 年 9 月 29 日)院務會議、課程委員會議暨教師評審委員會決議案執行情形記載表：

決議事項	決議情形	執行單位	執行情形
擬訂定「STEM 教育國際碩士學位學程學程會議設置要點」案	照案通過。	STEM 教育國際碩士學位學程	已公告於學程網頁。
擬訂定「國立屏東大學 STEM 教育國際碩士學位學程課程委員會設置要點」案	照案通過。	STEM 教育國際碩士學位學程	已公告於學程網頁。
擬訂定「國立屏東大學 STEM 教育國際碩士學位學程招生委員會設置要點」案	照案通過。	STEM 教育國際碩士學位學程	已公告於學程網頁。
擬訂定「國立屏東大學 STEM 教育國際碩士學位學程教師評審委員會設置要點」案	照案通過。	STEM 教育國際碩士學位學程	已公告於學程網頁。
擬訂定「國立屏東大學 STEM 教育國際碩士學位學程自我評鑑施行細則」案	照案通過。	STEM 教育國際碩士學位學程	已公告於學程網頁。
擬修訂「國立屏東大學 STEM 教育國際碩士學位學程修業要點」案	第(四)點本碩士學位學程學生每個學期修課上限更改為 16 學分，餘照案通過。	STEM 教育國際碩士學位學程	已提送 110 年 10 月 21 日教務會議審議，俟審查通過後公告更新版於學程網頁。

二、 111 年度預算調查表已於 110 年 10 月 13 日提報予主計室。

三、 已協助 STEM 學程及學院授課教師回傳安心就學線上補課表予課務

組。

參、提案討論：

提案一　　提案單位：國際暨創新學院

案由：本學院名稱擬由「國際暨創新學院」(Innovative International College)更名成「國際學院」(International College)案，請討論。

說明：因應學院業務調整，原推動跨領域學位學程業務已移轉至大武山學院跨領域學程中心辦理，且考量未來學院整體發展規劃並與他校名稱一致，故擬進行名稱更動事宜。

辦法：案經本次會議通過後提送校務發展委員會審議，並請綜合業務組提送校務會議審議。

決議：**照案通過，並擬自 110 學年度第 2 學期生效。**

提案二　　提案單位：國際暨創新學院

案由：有關資訊學院「國際資訊科技與應用碩士學位學程」調整至本學院案，請討論。

說明：

一、本案已於本(110)年 3 月 18 日簽核奉准在案(簽文請見附件一，P.4-5)。

二、為配合建構具國際化與前瞻性的課程，以及後續宣傳推廣順利，擬調整至本學院。

辦法：案經本次會議通過後提送校務發展委員會審議，並請綜合業務組提送校務會議審議。

決議：**照案通過，並擬自 110 學年度第 2 學期生效。**

提案三　　提案單位：STEM 教育國際碩士學位學程

案由：擬訂定 STEM 教育國際碩士學位學程課程架構表，請討論。

說明：

一、STEM 教育國際碩士學位學程於 109 年 8 月 24 日核定通過，並於本(110)學年起開始招生。

二、經 STEM 學程 110 學年度第 1 學期第 1 次學程課程委員會(110.10.18)通過。

三、通過後擬自本(110)學年度學生適用。

四、架構表(含修業要點)請見附件二，P.6-10。

決議：**照案通過，並逐年依實施情形進行修正。**

提案四　　提案單位：STEM 教育國際碩士學位學程

案由：110 學年度第 2 學期擬新開「研究方法」、「科學教育研究的英語溝通技巧與運用」及「科技融入 STEM 教學與學習研究」3 門課，請討論。

說明：

一、依據 STEM 教育國際碩士學位學程課程架構表辦理。

二、110 學年度第 2 學期擬新開 3 門課程(如下表所示，新開課程申請表請見附件三，P.11-27。

三、經 STEM 學程 110 學年度第 1 學期第 1 次學程課程委員會(110.10.18)通過。

序號	申請教師	課程名稱	備註
1	林曉雯 教授	研究方法 Research Methodology	與科學傳播學系合開
2	廖宜虹 助理教授	科學教育研究的英語溝通技巧與運用 English Communication for Science Education Studies	
3	蔡旻娟 助理教授	科技融入 STEM 教學與學習研究 Studies in Technologies in STEM Teaching and Learning	

辦法：案經本次會議通過後送校課程委員會審議。

決議：**修正後通過。**

肆、臨時動議：無。

伍、主席結論(語)：**謝謝大家出席本次會議。**

陸、散會：**同日 14 時 40 分。**

附件一

檔　　號：160603/001
保存年限：10

簽　於　國際暨創新學院

主旨：有關「國際資訊科技與應用碩士學位學程」變更學院負責案，簽請核示。

說明：

一、本校國際學位學程計有「國際資訊科技與應用碩士學位學程」及「STEM教育國際碩士學位學程」二學程，「國際資訊科技與應用碩士學位學程」已於109學年開始招生，學生人數計6人；「STEM教育國際碩士學位學程」於110學年開始招生，上述學程皆已開放110學年申請入學中。

二、配合建構跨領域且具國際化、前瞻性的課程，原資訊學院「國際資訊科技與應用碩士學位學程」擬自110學年起，變更為國際暨創新學院負責課程及相關業務。

擬辦：奉核後辦理組織變更及相關事宜。

會辦單位：教務處綜合業務組、國際事務處、人事室、資訊學院
決行層級：一層決行

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國立屏東大學
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——簽核流程及意見——

序	單位	職稱	姓名	意見	辦理時間
1	國際暨創新學院	組員	曾慧倩		110/03/18 10:36:19 (承辦)
2	國際暨創新學院	院長	施百俊		110/03/18 11:50:45 (核示)
3	教務處綜合業務組	組長	王貴芳		110/03/18 14:03:21 (會辦)
4	人事室第一組	組長	曾姵菁		110/03/18 14:54:11 (會辦)
5	人事室	主任	熊學敏		110/03/18 17:30:23 (會辦)
6	國際事務處	組員	李宗訓		110/03/19 08:29:11 (會辦)
7	教務處	教務長	施百俊		110/03/19 09:07:27 (會辦)
8	資訊學院	行政組員	蔡森竹	奉核後配合辦理	110/03/19 14:15:13 (會辦)
9	資訊學院	院長	王朱福		110/03/22 09:39:03 (會辦)
10	國際事務處	國際事務長	曾耀霆		110/03/22 10:12:34 (會辦)
11	秘書室	專門委員	張雯玲		110/03/22 11:08:34 (核示)
12	行政副校長室	行政副校長	劉英偉		110/03/22 11:42:39 (核示)
13	校長室	校長	古源光	如擬	110/03/22 18:20:59 (決行)

附件二

國立屏東大學 STEM 教育國際碩士學位學程修業要點

110 年 3 月 22 日本校 109 學年度第 2 學期第 1 次國際暨創新學院院務會議審議通過
110 年 4 月 8 日本校 109 學年度第 2 學期第 1 次教務會議審議通過
110 年 9 月 110 年 9 月 7 日本校 110 學年度 110 學年度第 1 學期 STEM 學程第 1 次學程會議審議通過
110 年 9 月 29 日 110 學年度第 1 學期國際暨創新學院第 1 次學程會議審議通過

一、依據

本要點依據「國立屏東大學碩士班研究生共同修業辦法」規定訂定「國立屏東大學STEM教育國際碩士學位學程修業要點」之(以下簡稱本要點)。

二、修業年限

本碩士學位學程規定修業年限最長為四年。

三、指導教授

(一)本碩士學位學程學生應於一年級上學期結束前，依其研究方向與興趣，諮請本學位學程授課專任助理教授（含）以上教師擔任指導教授，並填寫「碩士論文指導教授申請表」，經論文指導教授簽名後送至院辦公室存查。

(二)本碩士學位學程學生如遇必要原因要求更換指導教授，需申請後經過本學院同意始得更換。

四、選課、修課

(一)本碩士學位學程學生至少須修畢三十學分，其中包括必修課程三學分、論文六學分及選修研究所課程二十一學分，並符合下列各項規定者，方得畢業。

1.在規定年限內，修滿規定科目與學分，成績及格。

2.完成學術倫理數位課程並通過測驗，取得修課證明。

3.通過本校研究生學位考試辦法之各項考試與相關規定。

4.學位論文上傳前，應經論文比對系統比對，內容相似度結果須在 30%(含)以下為原則，結果經指導教授簽名後，始得畢業。

5.非英語系國家之碩士學位學程學生應於入學前通過 Common European Framework Level 語言能力指標 B1(含)以上之各式檢定;如未通過上述英文能力檢定者，得指定學生下修英文課程，該課程學分不得計入畢業學分。

6.修業期間在國內外學術期刊或學術研討會發表論文至少(含)一篇，始能申請畢業。

(二)本碩士學位學程學生得依本校相關規定修讀教育學程。

(三)本碩士學位學程學生修課成績同本校碩士班為七十分及格。

(四)本碩士學位學程學生每個學期修課上限為十六學分。

五、碩士學位考試分兩階段舉行，第一階段為「論文研究計畫發表」，第二階段為「論文考試」；論文考試以口試為原則，本碩士學位學程之學位論文及論文研究計畫，均應以英文撰寫及進行口試。

六、論文研究計畫發表

(一)本碩士學位學程學生需經由指導教授同意，方能提出論文研究計畫之申請，計畫通過後，始得進行論文研究。

(二)論文計畫發表審查為二人（若有二位擔任共同指導教授者，應增聘為三人），指導教授（協同指導教授）為當然委員，另一人由校內助理教授以上之教師擔任，惟因特殊需要得改由校外委員擔任之。

(三)論文研究計畫發表截止時間：第一學期為一月三十一日，第二學期為七月三十一日。

(四)論文研究計畫口試須全體委員出席始得進行考試。成績以七十分為及格，一百分為滿分，並以全體委員評定分數平均決定之。但有二分之一以上委員評定不及格，以不及格論，評定以一次為限。不及格時，一個月後得再提出口試申請。

七、碩士論文考試

(一)本碩士學位學程學生碩士論文考試應於論文計畫發表通過三個月後提出。

(二)碩士學位考試委員(含指導教授)為三人（若有二位擔任共同指導教授者，得增聘為四人），其中應有一位校外委員，指導教授不得擔任主持人。

(三)碩士論文考試截止時間：第一學期為一月十五日，第二學期為七月十五日。

(四)碩士論文考試成績之評定以七十分為及格，一百分為滿分，並以全體委員會評定分數平均決定之，但有二分之一以上委員評定不及格，以不及格論，評定以一次為限。學位考試成績不及格而其修業年限尚未屆滿者，得於修業年限內申請重考，重考以一次為限，重考成績仍不及格者，應予退學。

八、本要點若有未盡事宜悉依本校碩士班研究生共同修業辦法及相關規定辦理。

九、本要點經院務會議、教務會議通過，並陳校長核定後實施，修正時亦同。

本規章負責單位：STEM 教育國際碩士學位學程

STEM 教育國際碩士學位學程 課程架構

(適用 110 學年度起入學學生)

（一）課程架構與應修學分

1. 畢業學分數：三十學分 (含論文六學分)
2. 必修學分數：九學分
3. 選修學分數：二十一學分

（二）學程畢業學分數：三十學分，含論文必修六學分，經論文口試通過後方得畢業。

（三）非英語系國家之碩士學位學程學生應於入學前通過 Common European Framework Level 語言能力指標 B1(含)以上之各式檢定;如未通過上述英文能力檢定者，得指定學生下修英文課程，該課程學分不得計入畢業學分。

（四）修業期間在國內外學術期刊或學術研討會發表論文至少(含)一篇，始能申請畢業。

課程代碼	課程名稱	學分	時數	必選修	第一學年		第二學年		備註
					一年級		二年級		
					上	下	上	下	
一、方法課程（必修 3 學分，不含論文 6 學分）									
STEM004	研究方法 Research Methodology	3	3	必		✓			
STEM005	教育統計學 Educational Statistics	3	3	選			✓		
STEM006	測驗理論與編製 Test Theory and Development	3	3	選			✓		
STEM007	質化研究 Qualitative Research	3	3	選		✓			
STEM008	行動研究 Action Research	3	3	選			✓		
STEM009	論文 Thesis	6	6	必			✓	✓	一學期 3 學分 3 小時，需修畢二學期

學科教學（每一學科區塊至少選 1 門，3 學分）									
STEM003	科學探究與實作專題 Inquiry and Practice in STEM	3	3	選	✓				STEM Content
STEM010	物理專題研究 Topics of Physic	3	3	選	✓				
STEM011	化學專題研究 Topics of Chemistry	3	3	選		✓			
STEM012	生物專題研究 Topics of Biology	3	3	選		✓			
STEM013	環境科學專題研究 Topics of Environmental Science	3	3	選			✓		
STEM014	數學專題研究 Topics of Mathematics	3	3	選			✓		
STEM015	科技與工程專題研究 Topics of Engineering and Technology	3	3	選				✓	
STEM016	STEM 教育教學與評量 Instruction and Assessment in STEM Education	3	3	選	✓				STEM Education
STEM017	STEM 學習理論研究 Studies in STEM Learning Theories)	3	3	選		✓			
STEM018	STEM 教學與教師專業發展研究 Studies in Teaching and Teacher Development in STEM Education	3	3	選		✓			
STEM001	STEM 教育議題研究 Research on STEM Education Topics	3	3	選	✓				
STEM019	科技融入 STEM 教學與學習研究	3	3	選		✓			STEM Supporting Course

	Studies in Technologies in STEM Teaching and Learning								
STEM020	STEM 教育專題研究 Advanced Topics in STEM Education	3	3	選			✓		
STEM021	運算思維之 STEM 教育研究 Studies in Computational Thinking in STEM Education	3	3	選			✓		
STEM022	工程思維之 STEM 教育研究 Studies in STEM Education through Engineering Design	3	3	選			✓		
STEM023	科學教育研究的英語溝通技巧與運用 English Communication for Science Education Studies	3	3	選		✓			
STEM024	STEM 數學建模研究 Studies in Mathematical Modelling in STEM Education	3	3	選		✓			

國立屏東大學　新增課程申請表

附件三

開課單位名稱	STEM 教育國際碩士學位學程	申請日期	110 年 9 月 30 日
課程中文名稱	研究方法	選 修 別	■必修□選修
課程英文名稱	Research Methodology		
總學分數/時數	3	每學期開課學分數/時數	3
課程類別/學科領域	International Master Program in STEM Education		
預訂開課年級	□ 大學部 ■ 研究所　一 年級　下 學期		
開設本課程需要性	（請詳述開設本課程之背景因素） The course focuses on research methods in STEM education. It introduces the principles, concepts, and methods currently used in educational research. This course assists and enhances the development of students' competence in quantitative research methods, qualitative research methods, and mixed-methods and enables students to master skills in reading, understanding, critiquing, and conducting research. It's about how did the researcher go about deciding: What data to collect Who to collect it from How to collect it How to analyze it Students will apply their knowledge and skills to conduct research in STEM education.		
開設本課程教師所需之專業背景	（請詳述開課教師所需之專業背景） STEM Education, Research expertise and experience		
本校是否已開設相關課程	■是；課程名稱/開課單位：研究方法/科學傳播學系 □否		

需配合之儀器設備、圖書及教學資源		■ 有；需求如下：STEM books and academic Journals □ 無特殊需求
教學大綱	教學目標	This course aims to cultivate and enhance students' knowledge and skills about how a researcher systematically designs a study to ensure valid and reliable results that address the research aims and objectives. By the end of the course, students should be able to: 1. Demonstrate understanding of the principles, concepts, and methods currently used in educational research; 2. Compare and contrast quantitative and qualitative research paradigms; 3. Justify the choice of research methods in terms of "fitness of purpose" and "fitness for purpose"; 4. Describe a research design in terms of sampling methods, measurement scales and instruments, data collection, and data analysis; 5. Write a research proposal with relevant content and in an appropriate structure; 6. Present information in a research proposal in clear, accurate English and in appropriate academic style
	課程綱要	1. Introduction of a thesis (week 1~2) 2. Literature review (week 3~5) 3. Principles, concepts, and methods currently used in educational research: quantitative research methods (week 6~7) 4. Principles, concepts, and methods currently used in educational research: qualitative research methods (week 8~9) 5. Principles, concepts, and methods currently used in educational research: mixed-methods (week 10~11) 6. Compare and contrast quantitative and qualitative research paradigms (week 12) 7. Justify the choice of research methods (week 13) 8. Describe a research design in terms of sampling methods, measurement scales and instruments, and appropriate uses of each (week 14~15) 9. Write a research proposal (week 16~18)
	核心能力	■1. Academic discourse and communicative skills ■2. International perspectives and multicultural understandings ■3. STEM Specialized Content Knowledge and STEM Pedagogical Content Knowledge ■4. Inquiry-based and interdisciplinary approaches in STEM education ■5. Analytical reasoning, critical thinking, and innovative skills

	授課方式	Lecture Group Discussion Proposal Writing
	評量方式	Students will be assessed in a range of tasks, including: 1. Participation 10% 2. Formative assessment (such as writing a 2-page critique of a published research paper, a one-page interpretation of quantitative data, a one-page reflective journal after interview et al.) 30% 1. A midterm report: Outline Map of Proposal 10% 2. A final research proposal (with performance rubric) 50%
	主要讀本	1. McMillan, J. H., & Schumacher, S. (2014). Research in Education: Evidence-Based Inquiry, MyEducationLab Series. New Jersey: Pearson. 2. Honey, M., Pearson, G., & Schweingruber, H. (2014). STEM integration in K-12 education: Status, prospects, and an agenda for research (Vol. 500), National Academies Press Washington, DC. 3. Related academic journals articles.

註：

1.本案經____學年度第____學期第____次系課程委員會議、____學年度第____學期第____次院（中心）課程委員會議通過（**由開課單位填寫**）

2.本案經____學年度第____學期第____次課程委員會議通過（**由教務處填寫**）

Teaching and learning of Research Methodology

ILOs	Weeks	Assessment	Teaching/Learning experience	Materials
5.Write "Introduction" and "Literature review" of a research proposal	5	1.Introduction of research questions in your proposal 2.Literature Review in your proposal	1. Discussing about "how do you select a problem? 2. developing research questions 3.Searching and & managing reference reviews 4.Synthesizing the varying perspectives in the scholarly literature to situate the research question 5. APA format	3-1. Endnote 4-1. X-mind 5-1. Purdue online writing Lab (https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/general_format.html
1. Demonstrate understanding of the principles, concepts, and methods currently used in educational research	6	1. Identification and classification of related studies by methods including Survey, Secondary Data Analysis, Quasi-Experimental, Qualitative research, and Action research in your "literature review".	1. Reading academic papers or theses and classifying them by methods. 2. Practicing the use of different methods, e.g., survey, interviews, observation.	1-1. Endnote 4-1. X-mind
2. Compare and contrast quantitative and qualitative research paradigms;	1	The challenges and strategies of combination of quantitative and qualitative research paradigms in mixed methods.	1. Reading academic papers, theses, or chapters of books. 2. Identifying features of quantitative and qualitative methods.	1-1 Academic papers, theses, or chapters of books
3. Justify the choice of research methods in terms of "fitness of purpose" and "fitness for purpose";	1	1. Peer review on explanation and justification for the chosen method, process, or approach and its alignment with the research question for	1. Selecting a research design and describing the procedure to be employed for conducting the research study.	1-1. Academic papers and theses

		each students' proposal.	2. Discussing the links between purposes and methods.	
4. Describe a research design in terms of sampling methods, measurement scales and instruments, and appropriate uses of each;	2	Identification of sampling methods, measurement scales, and instruments and description of how to use of each in your proposal.	1. Practicing sampling methods, 2. Selecting and using measurement scales, instruments	2-1. Educational measurement scales and instruments
5. Write a research proposal with relevant content and in an appropriate structure; 6. Present information in a research proposal in clear, accurate English and in appropriate academic style	3	A research proposal less than 6,000 words in APA format	1. Structuring the research proposal: (1) Summary or abstract (2) Research question (3) Importance of the research topic (4) literature review (5) Research design (6) Ethical considerations (7) Limitations (8) Setting timetable (9) Citing references in APA format	1-1. X-mind 1-2. Endnote 1-3. Research proposal - Template (https://www.auckland.ac.nz/en/education/study-with-us/study-options/doctoral-programmes/provisional-year-review-research-proposal-template-1.html) 1-4. Purdue online writing Lab (https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/general_format.html)

Descriptors of proposal writing

	Content & Organization (60%)	**Structure & Formatting (20%)**	**Language Use (20%)**
	1. Is the content substantial and relevant to the purpose of a research proposal? 2. Is there evidence of comprehension the principles and concepts used in educational research? 3. Does the author provide strong justification for choices made in	1. Is the research proposal well structured? 2. Is there division of sections in the proposal? 3. Is attention paid to layout for easy reading? 4. Is key information referenced and	1. Are ideas presented in clear and accurate English? 2. Are arguments presented in appropriate style and tone expected of a research proposal?

	research methodology? 4. Are ethical issues in educational research addressed?	presented in proper APA style?	
Excellent (7)	· The author demonstrates *in-depth* understanding of the principles, concepts, and methods currently used in educational research; · The author *very clearly* describes a research design in terms of sampling methods, measurement scales and instruments, and *highly appropriate* uses of each *with strong justifications*; · The author *thoroughly* addresses ethical issues in research.	· The proposal is *exceedingly well structured* and balanced; · There is *very clear* division of sections; · The layout is *highly professional* and *pleasing* to the reader; · Key information is *expertly referenced* in the APA style.	· Ideas are presented in *very clear, accurate* and *idiomatic* English; · Arguments are presented in *highly appropriate style and tone*.
Very Good(6)	· The author demonstrates *quite good* understanding of the principles, concepts, and methods currently used in educational research; · The author *mostly clearly* describes a research design in terms of sampling methods, measurement scales and instruments, and *mostly appropriate* uses of each *with strong justifications*; · The author *quite well* addresses ethical issues in research.	· The proposal is *quite well structured* and balanced; · There is *quite clear* division of sections; · The layout is *quite professional* and *pleasing* to the reader; · Key information is *mostly referenced* in the APA style.	· Ideas are presented in *clear, accurate* and *idiomatic* English; · Arguments are presented in *appropriate style and tone*.
Good (5)	· The author demonstrates *good* understanding of the principles, concepts, and methods currently used in educational research; · The author *clearly* describes a research design in terms of sampling methods, measurement scales and instruments, and appropriate uses of each *with justifications*; · The author *addresses* ethical issues in research.	· The proposal is *well structured* and balanced; · There is *clear* division of sections; · The layout is *professional* and *pleasing* to the reader; · Key information is *referenced* in the APA style.	· Ideas are presented in *clear, accurate* and *idiomatic* English *most of the time;* · Arguments are presented in *appropriate style and tone most of the time;*
Satisfactory(4)	· The author demonstrates *somewhat*	· The proposal is *somewhat*	· Ideas are presented in *somewhat*

	good understanding of the principles, concepts, and methods currently used in educational research *but may be irrelevant to your study*; · The author *somewhat clearly* describes a research design in terms of sampling methods, measurement scales and instruments *but with some errors*, and *somewhat* appropriate uses of *some with justifications but with some irrelevance*; · The author *somewhat addresses* ethical issues in research. Some may be *inappropriately addressed.*	*structured* and balanced; · There is *somewhat clear* division of sections; · The layout is *somewhat professional* and *pleasing* to the reader; · Key information is *somewhat referenced* in the APA style.	*clear, accurate* and *idiomatic* English*;* · Arguments are presented in *somewhat appropriate style and tone;*
Marginal (3)	· The author demonstrates *rather limited* understanding of the principles, concepts, and methods currently used in educational research; · The author *makes a rather weak attempt* to describe a research design in terms of sampling methods, measurement scales and instruments, and *does not always provide adequate justifications*; · The author *makes little attempt* to address ethical issues in research.	· The proposal is *not well structured or balanced*; · The division of sections *is not always clear*; · The layout is *not professional looking*; · There are *frequent flaws* in the use of the APA style for referencing.	· The level of clarity and accuracy in using English is *not high*; · Arguments are often presented in in*appropriate style and tone*.
Poor(2)	· The author demonstrates *minimal* understanding of the principles, concepts, and methods currently used in educational research; · The author *makes a minimal attempt* to describe a research design in terms of sampling methods, measurement scales and	· The proposal is *not well structured or balanced*; · The division of sections *is not clear*; · The layout is *not professional looking*; · There are *many flaws* in the use of the APA style for referencing.	· The level of clarity and accuracy in using English is *limited*; · Arguments are *mostly* presented in *wrong style and tone*.

	instruments, and *provide minimal justifications*; · The author *makes minimal attempt* to address ethical issues in research.		
Very Poor(1)	· The author demonstrates *no* understanding of the principles, concepts, and methods currently used in educational research; · The author *makes no attempt* to describe a research design in terms of sampling methods, measurement scales and instruments, and *does not provide justifications*; · The author *makes no attempt* to address ethical issues in research.	· The proposal is *not structured or balanced*; · The division of sections *is not showed*; · The layout is *messy*; · There are *all flaws* in the use of the APA style for referencing.	· The level of clarity and accuracy in using English is *highly limited*; · Arguments are *totally* presented in *wrong style and tone*.

國立屏東大學　新增課程申請表

<table>
<tr><td>開課單位名稱</td><td colspan="2">STEM 教育國際碩士學位學程</td><td>申請日期</td><td>110 年 9 月 30 日</td></tr>
<tr><td>課程中文名稱</td><td colspan="2">科學教育研究的英語溝通技巧與運用</td><td>選 修 別</td><td>□必修■選修</td></tr>
<tr><td>課程英文名稱</td><td colspan="4">English Communication for Science Education Studies</td></tr>
<tr><td>總學分數/時數</td><td>3</td><td>每學期開課學分數/時數</td><td colspan="2">3</td></tr>
<tr><td>課程類別/學科領域</td><td colspan="4">International Master Program in STEM Education</td></tr>
<tr><td>預訂開課年級</td><td colspan="4">□ 大學部
■ 研究所　一 年級　下 學期</td></tr>
<tr><td>開設本課程需要性</td><td colspan="4">（請詳述開設本課程之背景因素）
Under the impact of globalization, this course is designed to increase students' English communication skills and science, technology, engineering, and mathematics (STEM) knowledge when they are engaged in educational interaction in which science educators or STEM professionalists regularly communicate with each other. In this course, students will be encouraged to explore the most innovative areas of scientific study and critical environmental issues while expanding their academic vocabulary and language skills needed to receive and share scientific information within the specific community or disciplines. This course is interdisciplinary in its approach and empowers students to develop essential skills for academic study, such as critical thinking, contributing to discussions, planning and giving presentations, effective note-taking, citation and referencing, summarizing and paraphrasing and avoiding plagiarism. Students are encouraged to study independently and work collaboratively, and to apply the course content to their further advanced science-based/STEM education courses in the chosen program or discipline.
with communicative strategies and academic language skills to succeed and adapt to this changing world.</td></tr>
<tr><td>開設本課程教師所需之專業背景</td><td colspan="4">（請詳述開課教師所需之專業背景）
English for Academic Purposes</td></tr>
<tr><td>本校是否已開設相關課程</td><td colspan="4">□是；課程名稱/開課單位
■否</td></tr>
</table>

需配合之儀器設備、圖書及教學資源		■ 有；需求如下： EAP Textbooks Oxford/Cambridge Advanced Learner's Dictionary Oxford Dictionary of Science Library resource tutorials
教學大綱	教學目標	The main objective of this course is to develop students' communication skills and specialist English language knowledge of science-based/STEM students and professionals, enabling them to communicate more confidently and effectively. In other words, students will be familiarized with science/STEM language by studying authentic texts and structures and analyzing the linguistic features of such texts. An integrated four-skill approach (listening, reading, writing and speaking) will be adopted to emphasize the accuracy of scientific linguistic and rhetoric characteristics in vocabulary, genres and styles, and the fluency of interactive communication and professional presentations in science education settings. **Intended Learning Outcomes:** On successful completion of the course, students will be able to *(Knowledge and Understanding)* • develop an upper-intermediate to advanced level of English proficiency in communication; • identify and recognize the format and structure of science-based articles and discourses; • increase awareness of the expected appropriate tone, style, register of an academic report and presentation; *(Skills and Abilities)* • identify ethical and educational issues in contemporary STEM education • engaged in topics based on examples of STEM-based issues and lesson plans • show an increased vocabulary within the area of science/STEM education • acquire confidence in both English receptive (listening and reading) and productive (writing and speaking) skills within the specific disciplines of science education

課程綱要

Weeks	Topics	Objectives	Assessments
1	Communication in Science/STEM Education ● Communication needs of science/STEM education students and professionals ● Communicating a clear, concise and correct manner	Students understand the importance of STEM education and develop attitudes to practice effective and appropriate communication skills	
2~4	Reading Critically (Receptive EAP skills) ● Identifying genre, audience, purpose, and perspective in scientific texts ● Identifying arguments and supporting evidence ● Identifying assumptions and asking critical questions about a text ● Evaluating objectivity in texts ● Distinguishing science, pseudoscience and bias ● Recognizing the difference between fact and opinion ● Academic Word List (AWL) and discipline vocabulary	Students analyze and discuss some of the major pedagogical, socio-cultural, and ethical issues that STEM educators face in their teaching, with reference to real-world cases.	
5~6	Listening Effectively (Receptive EAP skills) ● Establishing key words and understanding main ideas from the academic lectures, talks or seminars ● Recognizing signposting languages and understanding the language of perspectives in academic contexts ● Evaluating the summary of a presentation	Students discuss and evaluate STEM education based policies or multi-disciplinary/ trans-disciplinary teaching innovations.	1. STEM education issues based research proposal writing (the context, literature review and proposed methodology) 25%

7	Library workshop	Students learn research and referencing skill	
8~11	Writing Objectively (Productive EAP skills) ● Formal versus informal writing ● Steps to writing a research proposal for capstone project ● Critical and practical writing of academic texts ● Documenting research data (field notes, lab reports & visual representations) ● Describing scientific information: numerical data; processes; phenomena	Students develop critical and analytical writing skills to express opinions and evaluate perspectives on STEM education issue or policy.	2. STEM education issues based research proposal presentation (25%)
12~16	Presenting Professionally (Productive EAP skills) ● Contributing to a group discussion ● Planning, researching and giving a poster presentation ● Conducting an formal short talk and/or a seminar discussion	Students will integrate the understanding of the importance of STEM education and the role of communication to develop the skills to critically analyze STEM education issues and effectively present aimed at the general public	3. Completed STEM-education research paper (methodology, results and discussion, conclusion and abstract) (25%)
17	Oral Presentation & Peer Review		4. Completed STEM education research paper presentation (25%)
18	Course Review and Reflections		

核心能力	1. academic discourse and communicative skills 2. inquiry-based and interdisciplinary approaches in STEM education 3. analytical reasoning, critical thinking, and innovative skills
授課方式	1. Teacher-initiated lectures 2. Student-led conversation practice and formal presentation (individual, pair and group) 3. Group/Class discussion or seminar 4. Invited academic speeches

	評量方式	1. STEM-education issues based research proposal writing (the context, literature review and proposed methodology) 25% 2. STEM-education issues based research proposal presentation 25% 3. Completed STEM-education research paper (methodology, results and discussion, conclusion and abstract) 25% 4. Completed STEM-education research paper presentation 25%
	主要讀本參考資料	4. Armer, T. & Day, J. (2011). Cambridge English for Scientists. Cambridge University Press. 5. Purdue Online Writing Lab (OWL) https://owl.purdue.edu/owl/purdue_owl.html 6. National Geographic Classroom Resources. https://www.nationalgeographic.org/education/classroom-resources/ 7. STEM Learning. https://www.stem.org.uk/ 8. TED Talks. https://www.ted.com/talks?language=zh-tw 9. *Dynamic Presentations.* (2011). Cambridge University Press. 10. *Talk Like Ted: The 9 Public Speaking Secrets of the*

註：

1.本案經____學年度第____學期第____次系課程委員會議、____學年度第____學期第____次院（中心）課程委員會議通過（**由開課單位填寫**）

2.本案經____學年度第____學期第____次課程委員會議通過（**由教務處填寫**）

國立屏東大學　新增課程申請表

開課單位名稱	STEM 教育國際碩士學位學程	申請日期	110 年 09 月 30 日
課程中文名稱	科技融入 STEM 教學與學習研究	選 修 別	□必修 þ 選修
課程英文名稱	Studies in Technologies in STEM Teaching and Learning		
總學分數/時數	3	每學期開課學分數/時數	3
課程類別/學科領域	Studies in Technologies in STEM Teaching and Learning		
預訂開課年級	□ 大學部 ☑ 研究所　_____年級 _____學期		
開設本課程需要性	（請詳述開設本課程之背景因素） Technology has become an integral part of students' everyday life. Therefore, it is necessary to offer this course to educate future instructors on how to use and adapt different types of technology in their classroom.		
開設本課程教師所需之專業背景	（請詳述開課教師所需之專業背景） Educational Technology, English for Academic Purposes		
本校是否已開設相關課程	□ 是；課程名稱/開課單位： ☑否		
需配合之儀器設備、圖書及教學資源	☑ 有；需求如下： 1. Required textbooks 2. Computer/Laptop which will run the required software for this course (Apple Computer with iMovie installed, etc.) 3. Online tutorial videos		

		□ 無特殊需求
教學大綱	教學目標	1. Students will learn to use various types of technology they can incorporate into their teaching. 2. Students will design educational technology projects of their own to use for science education. 3. Students will be introduced to the current issues and trends regarding the use of technology into effective teaching and learning.
	課程綱要	

Weeks	Topics Covered	Assignments Due
Week 1	Introduction to the course Educational games through coding (Introduction to Scratch) Pitler, Hubbell, & Kuhn (2012). Chapter 1 In-class group discussions & practice	Textbook reading
Week 2	Educational games through coding (Building Lego Robots) Kopp (2015). Chapter 1 Oral presentation tutorial In-class group discussions & practice	Textbook reading
Week 3	Educational games through coding (Programming Lego Robots) Pitler, Hubbell, & Kuhn (2012). Chapter 2 In-class group discussions & practice	Textbook reading
Week 4	Educational games through coding (Programming Lego Robots) Kopp (2015). Chapter 2 In-class group discussions & practice	Textbook reading
Week 5	Presentation tools (Microsoft Powerpoint) Kopp (2015). Chapter 2 In-class group discussions & practice	Textbook reading Project #1: Educational games through coding
Week 6	Presentation tools (Prezi) Pitler, Hubbell, & Kuhn (2012). Chapter 3 In-class group discussions & practice	Textbook reading
Week 7	Presentation tools (Canva) Kopp (2015). Chapter 3	Textbook reading

			In-class group discussions & practice	
		Week 8	3D Modelling & Printing (CAD Software: Tinkercad) Reflection paper tutorial Pitler, Hubbell, & Kuhn (2012). Chapter 4 In-class group discussions & practice	Textbook reading Project #2: Presentation tools
		Week 9	3D Modelling & Printing (CAD Software: Blender/Solidworks) Kopp (2015). Chapter 4 In-class group discussions & practice	Textbook reading
		Week 10	3D Modelling & Printing CAD Software: (Blender/Solidworks) Pitler, Hubbell, & Kuhn (2012). Chapter 5 In-class group discussions & practice	Textbook reading Mid-term reflection paper
		Week 11	3D Modelling & Printing (3D Scanning & Laser Engraving) Kopp (2015). Chapter 5 In-class group discussions & practice	Textbook reading Project #3: 3D Printed Model
		Week 12	3D Modelling & Printing (3D Scanning & Laser Engraving) Pitler, Hubbell, & Kuhn (2012). Chapter 6 In-class group discussions & practice	Textbook reading
		Week 13	Multimedia (iMovie: Tutorial Video) Kopp (2015). Chapter 6 In-class group discussions & practice	Textbook reading Project #4: 3D Scanning & Laser Engraving
		Week 14	Multimedia (iMovie: Tutorial Video) Pitler, Hubbell, & Kuhn (2012). Chapter 7 In-class group discussions & practice	Textbook reading
		Week 15	Multimedia (iMovie: Tutorial Video) Kopp (2015). Chapter 7 In-class group discussions & practice	Textbook reading
		Week 16	Online portfolio (Weebly) Pitler, Hubbell, & Kuhn (2012). Chapter 8 In-class group discussions & practice	Textbook reading Project #5: iMovie tutorial video
		Week 17	Online portfolio (Weebly) Kopp (2015). Chapter 8,9 In-class group discussions & practice	Textbook reading
		Week 18	Final student project presentations	Final project

				presentation: Weebly online portfolio
	核心能力	1. English communication skills 2. Technology skills 3. Creativity skills		
	授課方式	1. Instructor lecture and tutorials 2. In-class group discussions and projects 3. Individual student presentations		
	評量方式	1. In-class attendance and participation: 10% 2. 5 educational technology projects : 30% 3. Mid-term reflection paper: 30% 4. Final individual project presentation and online portfolio (submission of the 5 educational technology projects completed during this semester) : 30%		
	主要讀本	*Both digital (Kindle) & paperback versions are available for all textbooks below. 1. Hamilton, B. (2014). *Integrating technology in the classroom: Tools to meet the need of every student*. International Society for Technology in Education. 2. Kopp, K. N. (2015). *Integrating Technology into the Curriculum 2nd Edition*. Teacher Created Materials. 3. Magaña, S., & Marzano, R. J. (2011). *Enhancing the art & science of teaching with technology*. Solution Tree Press. 4. November, A. (Ed.). (2009). *Empowering students with technology*. Corwin Press. 5. Pitler, H., Hubbell, E. R., & Kuhn, M. (2012). *Using technology with classroom instruction that works*. ASCD.		

註：

1.本案經____學年度第____學期第____次系課程委員會議、____學年度第____學期第____次院（中心）課程委員會議通過（**由開課單位填寫**）

2.本案經____學年度第____學期第____次課程委員會議通過（**由教務處填寫**）

評量方式	1. In-class participation: 10% 2. Educational technology projects (5 in total): 35% 3. Mid-term reflection paper: 20% 4. Final project presentation: online portfolio: 35%

國立屏東大學國際暨創新學院 110 學年第 1 學期第 2 次院務會議、

課程委員會議暨教師評審委員會議 簽到表

時間：110 年 10 月 25 日(星期一) 14 時

地點：Google Meet 線上會議

主持人：施院長百俊

出席者：

單位	職稱	姓名	出席狀況
國際暨創新學院	院長	施百俊	出席
國際暨創新學院	副院長	曾耀霆	出席
副校長室	副校長	林曉雯	出席
資訊學院	院長	王朱福	出席 (歐家和副院長代理)
STEM 教育國際碩士學位學程	主任	吳聲毅	出席
國際暨創新學院	行政組員	雲永仁	出席