

创新创业设计基础 教学大纲

Innovation, Entrepreneurship & Design Fundamentals Subject Syllabus

一、课程信息 Subject Information

课程编号: Subject ID	3100213004	开课学期: Semester	4
课程分类: Category	专业教育 PA	所属课群: Section	专业平台 MT
课程学分: Credit Points	4	总学时/周: Total Hours/Weeks	64
理论学时: LECT. Hours	56	实验学时: EXP. Hours	0
PBL 学时: PBL Hours	8	实践学时/周: PRAC. Hours/Weeks	0
开课学院: College	东北大学 悉尼智能科技学院	适用专业: Stream	CST/CE
课程属性: Pattern	必修 Compulsory	课程模式: Mode	引进 UTS
中方课程协调人: NEU Coordinator	韩鹏	成绩记载方式: Result Type	百分制 Marks
先修课程: Requisites	工程领导力		
英文参考教材: EN	无		

Textbooks			
中文参考教材: CN Textbooks	《新编大学生创新与创业教程》，李家华、刘农贵、焦新伟，南京大学出版社，ISBN9787310056330		
教学资源: Resources	Ebook: https://www.taylorfrancis.com/books/mono/10.1201/b17434/making-expert-engineer-james-trevelyan		
课程负责人(撰写人): Subject Director	韩鹏	提交日期: Submitted Date	2/1/2023
任课教师(含负责人): Taught by	Dr Leijia Wu (UTS), Dr Peng Han (NEU), Dr Yan Li (NEU)		
审核人: Checked by	韩鹏	批准人: Approved by	史闻博
		批准日期: Approved Date	2/2/2023

二、教学目标 Subject Learning Objectives (SLOs)

注：毕业要求及指标点可参照悉尼学院本科生培养方案，可根据实际情况增减行数

Note: GA and index can be referred from undergraduate program in SSTC website. Please add/reduce lines based on subject.

<p>整体目标: Overall Objective</p>	<p>Design and innovation are explored as fundamental engineering activities through a contextualised, authentic project. Students work in groups to develop an engineering prototype. The project promotes learning in the following areas:</p> <ul style="list-style-type: none"> ● design context and requirements: approaches to design, problem framing and creativity; requirements analysis involving legal, regulatory, technical and business requirements ● design analysis: concepts of risks and uncertainties in engineering; use of engineering and system modelling approaches and methods and techniques for assessing engineering design trade-offs, engineering decision-making in the presence of risks and uncertainties and optimisation ● new process, product and service development: role of engineers in evaluation and delivering new processes, products and services; designing for manufacture, sustainability, safety, innovation and business driven outcomes; risk management and design communication, documentation and review. <p>Students explore these concepts and use them to critique designed products, processes, and systems. Students develop an understanding of the models of design and innovation processes and the responsibilities and authentic practice of engineers through application of these concepts (as well as scientific principles learnt in their field of practice subjects) to their project.</p>	
<p>(1) 专业目标: Professional Ability</p>	<p>1-1</p>	<p>Understand the key architectural principles of the Innovation, design and entrepreneurship.</p>
	<p>1-2</p>	<p>Analyse various methodologies of the Innovation, design and entrepreneurship.</p>
	<p>1-3</p>	<p>Apply professional communication skills to document the full design process.</p>
	<p>1-4</p>	<p>Identify and apply the appropriate system-wide requirements for engineering design, demonstrating and justifying the application of trade-offs in the design process.</p>
<p>(2) 德育目标: Essential Quality</p>	<p>2-1</p>	<p>Understand the importance of Innovation, design and entrepreneurship to the social development.</p>
	<p>2-2</p>	<p>Understand the latest development of the innovation, design and entrepreneurship philosophies.</p>
	<p>2-3</p>	<p>Plan and monitor group work, manage group dynamics and appraise own and team member contributions.</p>
	<p>2-4</p>	<p>Keep a sense of the “Craftsman Spirit” through the study of this subject</p>
<p>课程教学目标与毕业要求的对应关系 Matrix of GA & SLOs</p>		

毕业要求 GA	指标点 GA Index	教学目标 SLOs
1、工程知识	1-3: 了解本专业涉及相关行业的发展趋势以及相关产业的运营模式, 具备在本专业相关领域进行工程设计、技术创新的能力。	1-1~1-4
6、工程与社会	6-1: 能够基于本专业相关背景知识进行合理分析, 评价通信相关工程实践和复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响;	2-1~2-4
	6-2: 理解本专业工程实践和相关行业工程问题解决方案对社会、健康、安全、法律以及文化应承担的责任。	

三、教学内容 Content (Topics)

注: 以中英文填写, 各部分内容的表格可根据实际知识单元数量进行复制、扩展或缩减

Note: Filled in both CN and EN, extend or reduce based on the actual numbers of knowledge unit

(1) 理论教学 Lecture

知识单元序号: Knowledge Unit No.	1	支撑教学目标: SLOs Supported	1-1、2-1、2-2
知识单元名称 Unit Title	Intro to Design and Innovation Fundamentals		
知识点: Knowledge Delivery	Design and Innovation Fundamentals		
	Stage Gate, Design Thinking and the Project		
	Group Dynamics & Project Management		
学习目标: Learning Objectives	了解: Recognize	Design and innovation fundamentals approaches.	
	理解: Understand	Concept of stage gate; design thinking; types of problems in engineering.	
	掌握: Master	Methods of implementing successful group dynamics; modern project management methodologies.	
德育目标 Moral Objectives	Understand the importance of innovation for countries worldwide.		
	Understand the latest development of the related approaches.		
重点: Key Points	Adoptions of stage gate in innovation process; Successful implementation of Design Thinking in product design.		
难点: Focal Points	Methods of implementing successful Group Dynamics & Project Management.		

知识单元序号: Knowledge Unit No.	2	支撑教学目标: SLOs Supported	1-2, 2-3
知识单元名称 Unit Title	Problem Definition and the Project Scope		
知识点:	Problem Definition and the Project Scope Methodologies		

Knowledge Delivery	Approaches in Analysing Users and their Needs	
	How to Enhance Creativity by Brainstorming	
	Principles of Innovation	
学习目标: Learning Objectives	了解: Recognize	Principles of Innovation
	理解: Understand	How to Enhance Creativity by Brainstorming
	掌握: Master	Problem definition and the project scope methodologies. Approaches in analysing users and their needs
德育目标 Moral Objectives	Understand the importance of innovation in social development and teamwork in entrepreneurship.	
重点: Key Points	Problem definition and the project scope methodologies. Principles of brainstorming.	
难点: Focal Points	Approaches in analysing users and their needs. Connections between user needs and project requirements.	

知识单元序号: Knowledge Unit No.	3	支撑教学目标: SLOs Supported	1-3、2-3
知识单元名称 Unit Title	Selecting the Solution, Market Opportunities		
知识点: Knowledge Delivery	How to Select the Solution, and Seize the Market Opportunities		
	The Solution Pitch & Requirement Definition		
	Design Iterations and its Application in Engineering		
学习目标: Learning Objectives	了解: Recognize	Concepts of the Solution Pitch	
	理解: Understand	Ways to implement design iteration; methods in applying risk assessment	
	掌握: Master	Design iterations application in engineering	
德育目标 Moral Objectives	Understand the importance of proper management methodologies in engineering project.		
重点: Key Points	Ways to implement proper requirement definition; Methods in applying risk assessment; Ways to establish the solution pitch.		
难点: Focal Points	Design iterations and its application in engineering		

知识单元序号: Knowledge Unit No.	4	支撑教学目标: SLOs Supported	1-3、2-3
知识单元名称 Unit Title	Prototype Pitch & Building the Business Case		
知识点: Knowledge Delivery	Prototype Pitch & Next Steps		
	Building the Business Case		
	Presenting your Business Case		
学习目标:	了解:	Concepts of the prototype pitch	

Learning Objectives	Recognize	
	理解: Understand	Approaches to build the business case and presentation.
	掌握: Master	Tools and methods to present your business case.
德育目标 Moral Objectives	Keep a sense of engineering ability and “Craftsman Spirit” through the study of the subject. Understanding of engineering ethics.	
重点: Key Points	Concepts of prototype pitch.	
难点: Focal Points	Presenting your business case in a proper way.	

知识单元序号: Knowledge Unit No.	5	支撑教学目标: SLOs Supported	1-4、2-4
知识单元名称 Unit Title	Entrepreneurship Fundamentals		
知识点: Knowledge Delivery	Connotation of entrepreneurship, the value and meaning of entrepreneurship.		
	Basic types of entrepreneurships, the basic elements of entrepreneurship and the training of entrepreneurial thinking.		
	Recognize the risks of innovation and entrepreneurship, and master rational entrepreneurial methods.		
学习目标: Learning Objectives	了解: Recognize	The process and method of entrepreneurship; common channels of venture financing and their characteristics.	
	理解: Understand	Recognize the risks of innovation and entrepreneurship, and master rational entrepreneurial methods.	
	掌握: Master	The concept and principles of the selection of entrepreneurial projects; method of writing; structure and content organization; presentation skills.	
德育目标 Moral Objectives	Understand the features of entrepreneurship with Chinese characteristics.		
重点: Key Points	Identification and evaluation of entrepreneurial opportunities.		
难点: Focal Points	Recognize the risks of innovation and entrepreneurship, and master rational entrepreneurial methods.		

四、教学安排 Teaching Schedule

注：可根据实际情况增减行数

Note: Please add/reduce lines based on subject.

教学内容 Teaching Content	学时(周)Hour(Week)			
	理论	实验	课外实践	集中实践

	LECT.	EXP.	PBL	PRAC.
Intro to Design and Innovation Fundamentals	12			
Problem Definition and the Project Scope	12			
Selecting the Solution, Market Opportunities	12			
Prototype Pitch & Building the Business Case	12		4	
Entrepreneurship Fundamentals	8		4	
总计 Total	56		8	

五、教学方法 Teaching Methodology

注：可根据实际情况增减行数或修改内容

Note: Please add/reduce lines or revise content based on subject.

勾选 Check	教学方法与特色 Teaching Methodology & Characters
<input checked="" type="checkbox"/>	多媒体教学：基于信息化设备的课堂教学 Multi-media-based lecturing
<input checked="" type="checkbox"/>	实践能力传授：理论与行业、实际案例相结合 Combining theory with industrial practical problems
<input checked="" type="checkbox"/>	课程思政建设：知识讲授与德育相结合 Knowledge delivery with ethic education
<input checked="" type="checkbox"/>	PBL 教学：问题驱动的分组学习与交流 Problem-based learning
<input type="checkbox"/>	其他:单击或点击此处输入文字。 Other:单击或点击此处输入文字。

六、成绩评定 Assessment

注：可根据实际情况增减行数或修改内容

Note: Please add/reduce lines or revise content based on subject.

考核环节: Assessment Content	平时 Behavior	环节负责人: Director	SSTC Co-teachers
给分形式: Result Type	百分制 Marks	课程总成绩比重(%): Percentage (%)	30
考核方式: Measures	<p>Attendance Check (100pts): Based on the individual statistics exported from Chaoxing platform by the SSTC co-teachers at the end of the semester. Students with attendance rate less than 2/3 shall retake the subject and not be allowed to attend the final assessment.</p> <p>Additional Points(±5pts per time): Bonus or penalty to a student or a group based on the outstanding or improper performance of the</p>		

	<p>students during the activities of the subject delivery*. Actions with additional points can be nominated by UTS academics, tutors, and co-teachers. SSTC co-teachers shall make it to the statistics.</p> <p>*The final behavior score with the additional points shall be no more than 100 points, not less than 0 points.</p>
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考核环节: Assessment Content	期中 Mid-term	环节负责人: Director	SSTC Co-teachers
给分形式: Result Type	百分制 Marks	课程总成绩比重(%): Percentage (%)	30
考核方式: Measures	<p>Group Documents (50 pts): A comprehensive assessment by SSTC co-teachers towards the documents generated by each group in the subject, e.g., Group Charter, Group Contract and Meeting Minutes. During the subject delivery, those documents shall be submitted in time to CC Canvas corresponding web pages by the instruction of UTS tutors, and then be collected and marked by SSTC co-teachers at the end of the semester.</p> <p>Prototype Pitch (50 pts): A comprehensive assessment by SSTC co-teachers towards the Video Presentation and Demos of each group. Before the end of the semester, each group shall submit a packet of the Prototype Pitch files (Tencent or ZOOM presentation recording, photos, ppt slides, engineering files, etc.) to Chaoxing Platform corresponding web pages by the instruction of SSTC co-teachers, and then be collected and marked by SSTC co-teachers too at the end of the semester.</p>		

考核环节: Assessment Content	期末 Final	环节负责人: Director	SSTC Co-teachers
给分形式: Result Type	百分制 Marks	课程总成绩比重(%): Percentage (%)	40
考核方式: Measures	<p>Design Brief (100pts): A group report marked by SSTC co-teachers based on the “Design Brief Marking Guide” on CC Canvas. (https://lms.cloudcampus.com.cn/courses/28/assignments/188).</p> <p>At the end of the semester, each group shall submit its Design Brief to CC Canvas corresponding web pages by the instruction of UTS tutors, and then be collected and marked by SSTC co-teachers. The group mark shall be generated while the students, as the members of each group, shall also be assessed individually and comprehensively* via his/her contributions to the group report.</p> <p>*Each group shall provide a list containing student ID, names, duties, and contribution percentage as an affiliation at the end of the Design Brief.</p> <p>Matters not covered of the whole assessment shall be discussed and</p>		

	determined by the faculty meetings of the subject.
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Note:

Group Charter/ Contract: <https://lms.cloudcampus.com.cn/courses/28/pages/managing-your-group>

Prototype Pitch: <https://lms.cloudcampus.com.cn/courses/28/assignments/199>

Design Brief Marking Guide: <https://lms.cloudcampus.com.cn/courses/28/assignments/188>

七、改进机制 Improvement Mechanism

注：未尽事宜以教学团队以及学院教学指导委员会商定为准。

Note: Matters not covered in this file shall be determined by TAB of SSTC, NEU.

教学大纲改进机制 Subject Syllabus Improvement Mechanism			
考核周期(年): Check Period (YR)	4	修订周期(年): Revise Period (YR)	4
改进措施: Measures	课程负责人根据课程教学内容与人才培养目标组织课程团队讨论并修改教学大纲，报分管教学工作副院长审核后由执行院长批准。 The subject coordinator shall be responsible for the syllabus discussion and improvement, and the revised version shall be submitted to deputy dean (teaching affairs) for reviewing then to executive dean for approval		
成绩评定改进机制 Assessment Improvement Mechanism			
考核周期(年): Check Period (YR)	1	修订周期(年): Revise Period (YR)	1
改进措施: Measures	课程负责人根据课程教学内容、课堂教学效果以及成绩分布，对课程教学方法和成绩评定环节进行改进，并同步优化评定办法。 The subject coordinator shall revise the syllabus based on the teaching content, effect and result distribution while optimize the assessment measures.		