香港城市大學
City University of Hong Kong

SYL-TPG
(Interim)

Course Syllabus

offered by Department of Chemistry
with effect from Semester A 2024/25

This form is for the completion by the *Course Leader*. The information provided on this form is the official record of the course. It will be used for the City University's database, various City University publications (including websites) and documentation for students and others as required.

Please refer to the Explanatory Notes on the various items of information required.

Prepared / Last Updated by:

Name:	Prof. Zonglong ZHU	Academic Unit:	Department of Chemistry
Phone/email:	3442 6559/ zonglzhu@cityu.edu.hk	Date:	29 December 2023

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Part I Course Overview

Course Title:	Advanced Entrepreneurship Programme in Chemistry
Course Code:	CHEM6133
Course Duration:	1 semester
Credit Units:	3 credits
Level:	P6
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	Nil
Precursors: *(Course Code and Title)*	Nil
Equivalent Courses: *(Course Code and Title)*	Nil
Exclusive Courses: *(Course Code and Title)*	Nil

Part II Course Details

1. Abstract

(A 150-word description about the course)

Entrepreneurial activities serve as a vital catalyst for fostering innovation and driving economic growth. The Advanced Entrepreneurship Programme in Chemistry is designed to cultivate an entrepreneurial mindset among chemistry students, equipping them with both theoretical knowledge and practical skills in scientific and technological entrepreneurship. The course aims to empower students to embrace the mentality of technology entrepreneurship and provides them with an understanding of the fundamental steps involved in establishing technology-based enterprises within the realm of chemistry and related scientific and engineering disciplines. Emphasis is placed on fostering effective communication skills essential in technical entrepreneurship, including patent formatting, language usage, and storytelling abilities for successful business interactions. The course primarily focuses on the development of chemistry-related business ideas and is strategically offered early in the MSc programme, providing students with ample time to gather data and substantiate their entrepreneurial concepts.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs[#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Identify and analyze the major technology-related industries in Hong Kong and the rest of the Great Bay Area, and assess their potential for future growth.	10%	✓	✓	
2.	Demonstrate an understanding of the different types, purposes, and basic format of Hong Kong, China, US and international patents, and effectively utilize methods for searching patent databases.	30%	✓	✓	
3.	Develop effective presentation and storytelling skills for business meetings, employing techniques to engage and captivate the audience.	20%	✓	✓	✓
4.	Evaluate and critically analyze the key qualities and characteristics of successful entrepreneurs through engaging in site visits and interacting with experienced business mentors.	10%	✓	✓	✓
5.	Describe the funding potential and pathways available for technical entrepreneurship in Hong Kong and the rest of the Great Bay Area, including identifying sources of funding and understanding the process of securing investment.	30%	✓	✓	✓
** If weighting is assigned to CILOs, they should add up to 100%.*		100%			

[#] Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines

or applying academic knowledge to self-life problems.

A3: *Accomplishments*
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.					Hours/week (if applicable)
		1	2	3	4	5	
In-class discussions and presentation	Product Research and Development Exercise: Students will engage in a practical exercise focused on researching and developing a new type of sunscreen (or other chemical product) in the market. They will analyze existing products, identify gaps or areas for improvement, and propose innovative ideas for their hypothetical new product. Overview of Technology-Related Industries: An overview of the technology-related industries in the Greater Bay Area of China will be provided. Students will gain insights into the various industries and their potential for growth, with a specific focus on the chemistry sector. Identification of Key Manufacturers: Students will be tasked with identifying the key manufacturers relevant to their hypothetical new product. They will conduct research and evaluate potential manufacturers based on their capabilities, expertise, and suitability for producing the proposed product. Guest Lectures and Industry Experts: Guest lectures and interactions with industry experts will be organized to provide students with real-world insights and experiences related to entrepreneurship in the chemistry field. These experts will share their knowledge, challenges, and success stories, offering valuable perspectives on launching and managing technology-based ventures.	✓	✓	✓	✓	✓	26 hours in total

Small group presentation, Proposal report	Case Studies and Analysis: Case studies of successful and innovative ventures in the chemistry industry will be discussed and analyzed. Students will examine the strategies employed, the challenges faced, and the factors that contributed to their success, enabling them to gain practical knowledge and insights applicable to their own entrepreneurial pursuits. Group Projects and Presentations: Students will work in groups to develop comprehensive business plans for their hypothetical new products. They will conduct market research, assess the competitive landscape, formulate marketing strategies, and create financial projections. The groups will present their business plans, allowing for peer feedback and constructive discussions. Reflective Exercises and Discussions: Regular reflective exercises and group discussions will be conducted to encourage students to reflect on their learning experiences, challenges encountered, and personal growth as aspiring entrepreneurs. These activities will foster critical thinking, self-awareness, and continuous improvement. Workshops and Skill Development: Workshops will be conducted to enhance students' skills in areas such as patent searching, effective communication, presentation techniques, and storytelling skills. These workshops will equip students with essential entrepreneurial competencies necessary for success in the chemistry industry.		✓	✓	✓		10 hours in total
Field Trips and Industry Visits	Students will have the opportunity to visit relevant industries, research institutions, or start-ups in the Greater Bay Area. These field trips will provide first-hand exposure to the entrepreneurial ecosystem,			✓	✓	✓	6 hours in total

	allowing students to gain practical insights and learn from real-world examples.						

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.					Weighting*	Remarks
	1	2	3	4	5		
Continuous Assessment: 60%							
Class discussion/Quiz	✓	✓	✓	✓	✓	15%	
Group presentation		✓	✓	✓		25%	
Proposal report		✓	✓	✓	✓	20%	
Examination: 40% (duration: 2.5 hours)							
Examination	✓	✓	✓	✓	✓	40%	
** The weightings should add up to 100%.*						100%	

Starting from Semester A, 2015-16, students must satisfy the following minimum passing requirement for CHEM courses:

"A minimum of 40% in both coursework and examination components."

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Class quiz and discussion	Assess the students' knowledge and understanding of entrepreneurship in the context of chemistry. This may include written assessments, quizzes, or exams that evaluate their comprehension of key concepts, theories, and principles related to entrepreneurial activities in the chemistry field.	High	Significant	Moderate	Not even reaching marginal levels
2. Group presentation	Evaluate the students' ability to effectively communicate and present their entrepreneurial ideas and plans in written and oral formats. This may include written reports, business pitches, or presentations where students demonstrate clarity, persuasiveness, and effective communication skills relevant to entrepreneurship in chemistry.	High	Significant	Moderate	Not even reaching marginal levels

3. Proposal report	Evaluate the students' ability to apply entrepreneurial skills and techniques in practical contexts within the chemistry industry. This may involve analyzing case studies, developing business plans, or engaging in simulated entrepreneurial activities to demonstrate their ability to identify opportunities, assess risks, and develop strategies for success.	High	Significant	Moderate	Not even reaching marginal levels
4. Examination	Assess the students' critical thinking skills in evaluating and analyzing entrepreneurial challenges and opportunities specific to the chemistry field. This may include assessing market trends, analyzing competitive landscapes, or identifying opportunities for improvement or innovation.	High	Significant	Moderate	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

1. Introduction and Idea Generation:
- Overview of the course structure and objectives
- Introduction to the three-stage concept of university entrepreneurship education programs
- Case studies of successful business ideas in chemistry-related industries
- Exercise: Research and development of a new product idea in chemistry

2. Technology Industries and Market Opportunities:
- Introduction to technology-related industries, with a focus on chemistry-related industries in the Greater Bay Area of China
- Identifying key manufacturers for hypothetical new product ideas
- Exploration of market opportunities and potential for commercialization

3. Intellectual Assets and Patents:
- Understanding the types and purposes of intellectual assets, with a specific focus on patents
- Overview of the basic structure and format of technology patents
- Introduction to legal terminology commonly used in patents
- Practical exercise: Searching and reading patents related to students' product ideas

4. Learning Agility and Storytelling Skills:
- Definition and importance of learning agility in entrepreneurship
- Developing skills in effectively communicating learning agility and passion
- Techniques for storytelling and engaging presentations in business meetings
- Role-playing exercises and interactive activities to enhance communication skills

5. Path towards Technical Entrepreneurship:
- Examining the intellectual property landscape for inventions and product ideas
- Exploring funding opportunities and resources available for commercialization
- Introduction to CityU's funding programs for supporting entrepreneurial ventures
- Developing a roadmap for the commercialization of students' ideas

Integration into the Curriculum:
- Emphasizing the importance of developing original chemistry-related ideas with commercialization potential early in the undergraduate curriculum
- Linking students' ideas to their course selection and study priorities
- Further skill development in drafting patents, business proposals, and collecting experimental data to support patent applications

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Selected research reviews
2.	
3.	
…	

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

References:

Reis, S. R. N., & Reis, A. I. (2013, March). How to write your first patent. In 2013 3rd Interdisciplinary Engineering Design Education Conference (pp. 187-193). IEEE.

Voss, T., Paranjpe, A. S., Cook, T. G., & Garrison, N. D. (2017). A short introduction to intellectual property rights. Techniques in vascular and interventional radiology, 20(2), 116-120.

Van Rooij, E. (2019). Turning basic science discoveries into successful commercial opportunities. Cardiovascular research, 115(12), e127-e129.

Andrews, J., & Higson, H. (2008). Graduate employability, 'soft skills' versus 'hard' business knowledge: A European study. Higher education in Europe, 33(4), 411-422.

Crispeels, T., Uecke, O., Goldchstein, M., & Schefczyk, M. (2009). Best practices for developing university bioentrepreneurship education programmes. Journal of Commercial Biotechnology, 15(2), 136-150.

Gangemi, J. (2007), "A Weeklong Festival for Entrepreneurship", BusinessWeek, February 22,2007.http://www.businessweek.com/smallbiz/content/feb2007/sb20070222_645291.h tm?chan=smallbiz_smallbiz+index+page_today's+top+stories May.

Knight & Natalie Wong, "The Organizational X-Factor: Learning Agility", Korn Ferry Insights article, https://focus.kornferry.com/leadership-and-talent/the-organisational-x-factor-learning-agility/. Published on November 22, 2017, retrieved on May 3, 2019.

Rae, D (2010), Universities and enterprise education: Responding to the challenges of the new era, Journal of Small Business and Enterprise Development, Vol.17, No.4, pp.591-606.