

課程大綱

※課程名稱	中文	科學研究的洞察力與基本技巧	
	英文	To be a Scientist: Perspectives and Essential Skills	
開課學期	103 學年度第 2 學期		
※開課系所	基因體與系統生物學學位學程	※課號	(系所辦公室填寫)
※學分(數)	3	※必/選修	選修
※授課教師	張典顯		
全/半年	半年		
※課程概述 (至少 50 字)	<p>Most graduate schools teach students how to survey the scientific literature, identify meaningful scientific questions, and devise experiments to solve the problems. However, few graduate schools offer formal instruction to help students developing a good sense of historical perspectives and essential on-job skills, which are critical elements for becoming a good scientist. Successful formulation of critical concepts often result in significant advancement and major paradigm shift in science. Learning how these specific ideas evolved in a historical context can be quite educational and therefore beneficial to students aspiring to develop a career in sciences. Students will be asked to read short stories and/or papers, watch documentary films, if available, of pivotal individuals interviewed by distinguished fellow scientists in the field, present the learned lessons, and participate in lively discussions led by the instructor and/or invited scientists. It is hoped that, through these exercises, students can extract from these pioneering scientists a few long-lasting lessons, which in turn shall provide a deeper understanding as to how an individual scientist, functioning in the global scientific community, accomplishes the watershed breakthrough. The other half of this course will include a series of well-cropped lectures aiming to guide students on acquiring essential skills to become a functional scientist. These include, but not limited to, skills regarding how to give an effective talk, write a fundable proposal, form a vibrant research team, and become a successful practicing scientist. A major effort in this half will focus on sharpening the proposal-writing skills, which is arguably one of the weakest points for students in Taiwan.</p>		
課程目標	<p>This graduate-level course aims to help students develop a keen sense of historical perspectives in science and acquire essential transferrable skills, both of which are indispensable for students to embark on a successful science-oriented professional career.</p>		

課程要求 或 預修課程	Participating students must have at least undergraduate-level knowledge in biochemistry, genetics, or molecular biology, as well as at least a year of project-oriented laboratory experiences. This course is to be conducted entirely in English and in a relatively informal fashion designed to promote exchanges of ideas. To maximize student's learning outcome, participants are required to actively participate in discussions. Students will play a prominent role in shaping the success of the course under the supervision of the instructor.
主要 參考書目	W. I. B. Beveridge (1957) <i>The Art of Scientific Investigation</i> . Stuart Firestein (2012) <i>Ignorance: How It Drives Science</i> . Various biographies of key scientists to be discussed in the class.
備註	限碩博士班修課。

<p style="text-align: center;">※課程進度 或 課程規劃</p>	<p style="text-align: center;">請依上課的周數（16周~18周）填寫課程進度表&課程規畫表</p> <p>Week 1 Introduction and lectures on essential skills 2-4 Lectures on essential skills (continued) 5 Lectures on proposal writing and dissection of model proposals 6 Group discussion of formulating specific aims 7-8 Presentation of specific aims and group discussions 9-14 Student presentation of selected scientists and their key experiments 14-16 Dialogues with invited scientists on their career paths</p> <p>Tentative list of scientists to be discussed:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px;">1. Watson and Crick</td></tr> <tr><td style="padding: 2px;">2. Sydney Brenner</td></tr> <tr><td style="padding: 2px;">3. Melseson and Stahl</td></tr> <tr><td style="padding: 2px;">4. Dawn of recombinant DNA era (Ham Smith, Paul Berg, etc.)</td></tr> <tr><td style="padding: 2px;">5. Lee Hartwell</td></tr> <tr><td style="padding: 2px;">6. David Baltimore</td></tr> <tr><td style="padding: 2px;">7. Michael Bishop and Harold Varmus</td></tr> <tr><td style="padding: 2px;">8. Ira Herskowitz and Paul Nurse</td></tr> <tr><td style="padding: 2px;">9. Elizabeth Blackburn</td></tr> <tr><td style="padding: 2px;">10. Craig Venter/ Hamilton Smith (Genomics Age)</td></tr> </table> <p>This course will be conducted entirely in English. 授課方式：Lectures, student presentations, and group discussions 成績評量：作業, 口頭, 書面報告</p>	1. Watson and Crick	2. Sydney Brenner	3. Melseson and Stahl	4. Dawn of recombinant DNA era (Ham Smith, Paul Berg, etc.)	5. Lee Hartwell	6. David Baltimore	7. Michael Bishop and Harold Varmus	8. Ira Herskowitz and Paul Nurse	9. Elizabeth Blackburn	10. Craig Venter/ Hamilton Smith (Genomics Age)
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<p style="text-align: center;">※課程新開 或 課程異動 說明事項</p>	<p>本校有無開設類似的相關課程？ <input type="checkbox"/>有 <input checked="" type="checkbox"/>無</p> <p>說明： <u>提升研究生科學研究洞察力和寫作技巧。</u></p> <hr/> <hr/>										

（請詳細填寫，※為必填項目，若表格若不敷使用，請自行延伸調整。） 99/01/12 製表