

國立清華大學課程大綱【格式】

科號	GE 133100	組別		學分	2	人數限制	50
上課時間				教室			
科目中文名稱	西洋數學史						
科目英文名稱	History and Philosophy of Western Mathematics						
任課教師	Jia-Ming Ying						
擋修科目				擋修分數			

請勾選	此科目對應之系所課程規畫所欲培養之核心能力 Core capability to be cultivated by this course	權重 (百分比) Percentage
<input type="checkbox"/>	自我瞭解與溝通表達 Self-awareness, expressions & communication	<input type="text" value="25"/> %
<input type="checkbox"/>	邏輯推理與批判思考能力 Logical reasoning & critical thinking	<input type="text" value="25"/> %
<input type="checkbox"/>	科學思維與反思 Scientific thinking & reflection	<input type="text" value="50"/> %
<input type="checkbox"/>	藝術與人文涵養 Aesthetic & humanistic literacy	<input type="text"/> %
<input type="checkbox"/>	資訊科技與媒體素養 Information technology & media literacy	<input type="text"/> %
<input type="checkbox"/>	多元觀點與社會實踐 Diverse views & social practices	<input type="text"/> %

一、課程說明	<p>This course introduces the logic and development of Western (mainly European) mathematics, from ancient Egyptian and Babylonian mathematics, to Greek legacies (especially philosophies of mathematics and Euclid's <i>Elements</i>), through medieval Islamic and European mathematics and Renaissance developments, to early-modern inventions of calculus, philosophies, and non-Euclidean geometries.</p> <p>Except mathematics <i>per se</i>, this course also discusses the interactions between mathematics and society in Western civilisations. For example, in ancient Egyptian and Babylonian societies, what kind of people participated in mathematical activities? Did they have similar or distinct mathematical conceptions from those in modern times? How did Greek philosophies help shape the forms and contents of Euclidean geometry? What was the relationship between Islamic culture and their mathematics? Also, we discuss the concept developments of modern calculus and the controversies between Newton and Leibniz. For undergraduate students, this course helps them see mathematics beyond equations and understand the relation between mathematics and Western civilisations.</p>
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二、指定用書	There is no designated textbook for this course, but the reading materials and the professor's slides are all included in the scope of the examinations.		
三、參考書籍	<p>Reading materials are taken from the following references:</p> <ol style="list-style-type: none"> 1. Victor Katz, <i>A History of Mathematics</i> (New York: Pearson, 3rd edition 2017). 2. G.E.R. Lloyd, <i>Early Greek science: Thales to Aristotle</i> (New York: W. W. Norton & Company, 1974). 3. G.E.R. Lloyd, <i>Greek science after Aristotle</i> (New York: W. W. Norton & Company, 1975). 4. Stewart Shapiro, <i>Thinking about Mathematics: The Philosophy of Mathematics</i> (Oxford: Oxford University Press, 2000). 		
四、教學方式	Reading materials are designated for each week. Students are encouraged to read them before class, and the professor will discuss the contents with the students in class. There is a 90-minute open-book examination at mid-term. Before the end of the term there are group presentations, for which each group has to discuss with the professor beforehand about which topic they want to present. In the final week there is again be a 90-minute open-book examination.		
五、教學進度	週次	課程內容	指定閱讀
	Week 1	Introduction	
	Week 2	Ancient Egyptian society and mathematics	Bunt, Jones, and Bedient (1988), pp.1-41.
	Week 3	Babylonian society and mathematics	Bunt, Jones, and Bedient (1988), pp.42-64.
	Week 4	Ancient Greek culture and early Pythagorean school	Katz (2017), pp.46-51 Lloyd (1974), pp.24-35.
	Week 5	Mathematics in Greek philosophy: Plato vs Aristotle	Shapiro (2000), pp.49-72
	Week 6	Euclid's <i>Elements</i> (I)	Katz (2017), pp.58-94.
	Week 7	Euclid's <i>Elements</i> (II)	
	Week 8	Mid-term examination	
	Week 9	Hellenistic mathematics: Archimedes to Heron	Katz (2017), pp.102-115; 156-167. Lloyd (1975), pp.33-52
	Week 10	The Islamic world and mathematics (Group presentation proposals)	Katz (2017), pp.238-287.
	Week 11	Medieval European society and mathematics	Katz (2017), pp.288-326.
	Week 12	Renaissance society and mathematics	Katz (2017), pp.342-384.
	Week 13	The development and controversies of calculus in the 17 th century	Katz (2017), pp.468-543.

	Week 14	Group presentation I	
	Week 15	Group presentation II	
	Week 16	Final examination	
六、成績考核	Classroom participation 10% Mid-term examination 30% Group presentation 30% Final examination 30%		
七、講義位址 http://	All materials are uploaded in the university platform eLearn.		