

The Hong Kong Polytechnic University

Subject Description Form

Please read the notes at the end of the table carefully before completing the form.

Subject Code	CHC1M39M
Subject Title	Science and Civilisation in Pre-Modern China 中國古代科技與文明
Credit Value	3
Level	1
Pre-requisite/ Co-requisite/ Exclusion	Exclusion: CHC1M39, CHC1M39P and CHC327
Objectives	This course introduces the technological and scientific advances, discoveries, and inventions—and the changes in shared social and cultural ideas about science and technology—from antiquity to the late imperial period in China. Two important questions animating this course are: when we foreground science and technology as a window onto Chinese history, how does it look different? How can a study of Chinese science and technology offer theoretical and methodological insights to the Eurocentric question of “why the scientific revolution did not take place in China?” The course is organized thematically, covering prominent topics essential to the history of science, scientific thought and technology in pre-modern China. Course materials include a sourcebook to introduce broad themes, scholarly monographs and articles, primary sources on classic Chinese scientific and technological works, and visual and material artifacts.
Intended Learning Outcomes (Note 1)	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. Understand Historical Contexts: Students will be able to describe the major technological and scientific advances in imperial China and explain their historical contexts and impacts on society and culture. b. Analyze Cultural Perspectives: Students will critically analyze how shared social and cultural ideas about science and technology evolved in China over time and compare these with contemporary Eurocentric perspectives. c. Evaluate Theoretical Frameworks: Students will evaluate different theoretical and methodological approaches to studying the history of science and technology in China. d. Interpret Primary Sources: Students will develop skills in interpreting primary sources, including classic Chinese

	<p>scientific and technological texts, and use these sources to support historical arguments.</p> <p>e. Communicate Insights: Students will effectively communicate their insights and analyses through written and oral presentations, demonstrating a nuanced understanding of the course material.</p>																																								
<p>Subject Synopsis/ Indicative Syllabus</p> <p>(Note 2)</p>	<p>1. Introduction and Framing</p> <p>2. Reaching Out to the Sky: Ancient Chinese Astrology and Astronomy</p> <p>3. Farming is the Base: Agriculture and Agrarian Technologies</p> <p>4. The Warp and The Weft: Textile Knowledge and Technologies</p> <p>5. Medicine and Healing (I): Canons and Ideas</p> <p>6. Medicine and Healing (II): Practices and Techniques</p> <p>7. The Making of Things (I): Artisans and Scholars</p> <p>8. The Making of Things (II): Artefacts and Production</p> <p>9. Food Science and Technology</p> <p>10. Gendering Science and Technology</p> <p>11. Jesuit Missionaries and Western Science</p> <p>12. The Making of “Four Great Inventions”</p> <p>13. Conclusion: Rethinking Technology, Innovation, and History in China in a Global Context</p>																																								
<p>Teaching/Learning Methodology</p> <p>(Note 3)</p>	<p>Each week, the course will consist of two 50-minute lectures and one 50-minute tutorial. The lectures will utilize a variety of teaching aids, including textual, pictorial, audio, and video materials. At the beginning of the semester, students will choose a topic or issue related to Chinese science and civilization to study, which will form the basis for their oral presentations during the tutorials. At the end of the course, students are required to submit a final written essay, developed from their chosen topic and refined according to the instructor’s feedback.</p>																																								
<p>Assessment Methods in Alignment with Intended Learning Outcomes</p> <p>(Note 4)</p>	<table><tr><th rowspan="2">Specific assessment methods/tasks</th><th rowspan="2">% weighting</th><th colspan="5">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th></tr><tr><th>a</th><th>b</th><th>c</th><th>d</th><th>e</th></tr><tr><td>1. Final Quiz</td><td>30</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td></tr><tr><td>2. Oral Presentation</td><td>30</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr><tr><td>3. Final Essay</td><td>40</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr><tr><td>Total</td><td>100 %</td><td colspan="5"></td></tr></table> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p>	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					a	b	c	d	e	1. Final Quiz	30	√	√	√	√		2. Oral Presentation	30	√	√	√	√	√	3. Final Essay	40	√	√	√	√	√	Total	100 %					
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	<ol style="list-style-type: none"> 1. The final quiz, comprising multiple choice questions and short answer questions, will help students gauge the key concepts of technological development and major issues of Chinese culture covered in the lectures. 2. Oral presentations can best assess the students' overall grasp of the knowledge and skills. It is also a best opportunity for students to raise their questions, interact with each other, and actively participate in discussion. 3. The final essay will best assess the students' consolidation of the knowledge and skills learnt from the subject and their ability to present some particular aspects of the subject. 	
Student Study Effort Expected	Class contact:	
	▪ Lectures	26 Hrs.
	▪ Tutorials	13 Hrs.
	Other student study effort:	
	▪ Preparation & Participation: Reading and Self-study	42 Hrs.
	▪ Assessment: Report and essay writing	36 Hrs.
	▪ Assessment: Group presentation/Project	12 Hrs.
	Total student study effort	129 Hrs.
Reading List and References	<p><u>Primary Sources:</u></p> <ol style="list-style-type: none"> 1. 《考工記》 Jun, Wenren. <i>Ancient Chinese Encyclopedia of Technology: Translation and Annotation of the Kaogong ji (the Artificers' Record)</i>. Routledge, 2013. 2. 《天工開物》 Sung, Ying-hsing 宋應星. <i>T'ien-kung K'ai-wu: Chinese Technology in the Seventeenth Century</i>. Trans. and annot. by Sun E-tu Zen and Sun Shiou-chuan. Dover: Pennsylvania State University Press, 1997. 3. 《黃帝內經：素問》 <i>Huang Di Nei Jing Su Wen: An Annotated Translation of Huang Di's Inner Classic – Basic Questions: 2 Volumes</i>. Translated by Unschuld, Paul, and Hermann Tessenow. Berkeley: University of California Press, 2011. <p><u>Secondary Sources:</u></p> <ol style="list-style-type: none"> 4. Barbieri-Low, Anthony. <i>Artisans in Early Imperial China</i>. 	

	<p>Seattle: University of Washington Press, 2007.</p> <ol style="list-style-type: none"> 5. Bodde, Derk, <i>Chinese Thought, Society, and Science: The Intellectual and Social Background of Science and Technology in Pre-modern China</i>. Honolulu: University of Hawaii Press, 1991. 6. Bray, Francesca. <i>Technology and Gender: Fabrics of Power in Late Imperial China</i>. Berkeley: University of California Press, 1997. 7. Elman, Benjamin. <i>A Cultural History of Modern Science in China</i>. MA: Harvard University Press, 2008. ———. <i>On Their Own Terms: Science in China, 1550–1900</i>. MA: Harvard University Press, 2005 8. Elvin, Mark. “The High-level Equilibrium Trap: The Causes of the Decline of Invention in the Traditional Chinese Textile Industries,” in W. E. Willmott, ed., <i>Economic Organization in Chinese Society</i>. Stanford: Stanford University Press, 1972. 9. Furth, Charlotte. <i>A Flourishing Yin: Gender in China’s Medical History, 960–1665</i>. Berkeley: University of California Press, 1999. 10. Golas, Peter J. <i>Picturing Technology in China: From Earliest Times to the Nineteenth Century</i>. Hong Kong: Hong Kong University Press, 2015. 11. Hinrichs, T. J. and Linda L. Barnes, eds. <i>Chinese Medicine and Healing: An Illustrated History</i>. Cambridge, MA: Harvard University Press, 2013. 12. Ko, Dorothy. <i>The Social Life of Inkstones: Artisans and Scholars in Early Qing China</i>. Seattle and London: University of Washington Press, 2017 13. Ledderose, Lothar. <i>Ten Thousand Things: Module and Mass Production in Chinese Art</i>. Princeton: Princeton University Press, 2000. 14. Lo, Vivienne and Michael Stanley-Baker, with Dolly Yang, eds. <i>Routledge Handbook of Chinese Medicine</i>. London: Routledge, 2022 (multiple entries on Chinese medicine). 15. Needham, Joseph (often with collaborators). <i>Science and Civilization in China</i>. Cambridge: Cambridge University Press, 1954– (in multi-volumes and multi-parts). ———. <i>The Grand Titration: Science and Society in East and West</i>. London; New York: Routledge, 2013. 16. Pacey, Arnold and Francesca Bray. <i>Technology in World Civilization: A Thousand-Year History</i>. Cambridge, Massachusetts: The MIT Press, 2021. 17. Schäfer, Dagmar. <i>The Crafting of the 10,000 Things: Knowledge and Technology in 17th Century China</i>. Chicago: The University of Chicago Press, 2011 18. Sivin, Nathan. “Why the Scientific Revolution Did Not Take Place in China—or Didn’t It?,” <i>Chinese Science</i> 5 (1982): 45–66 (revised in 2005). 19. Timothy Brook, “The Sinology of Joseph Needham,”
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	<p><i>Modern China</i> 22.3 (1996): 340–348</p> <p>20. Wilkinson, Endymion. “VII: Technology & Science,” in <i>Chinese History: A New Manual</i> (Enlarged Sixth Edition). MA: Harvard University Asia Center, 2022.</p> <p>21. Wu, Shellen Xiao and Fa-ti Fan, “China,” in Hugh Richard Slotten, Ronald L. Numbers, and David N. Livingstone, eds., <i>Cambridge History of Science</i>, vol. 8, <i>Modern Science in National, Transnational, and Global Context</i> (Cambridge: Cambridge University Press, 2020), 521–554.</p>
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Note 1: Intended Learning Outcomes

Intended learning outcomes should state what students should be able to do or attain upon subject completion. Subject outcomes are expected to contribute to the attainment of the overall programme outcomes.

Note 2: Subject Synopsis/Indicative Syllabus

The syllabus should adequately address the intended learning outcomes. At the same time, overcrowding of the syllabus should be avoided.

Note 3: Teaching/Learning Methodology

This section should include a brief description of the teaching and learning methods to be employed to facilitate learning, and a justification of how the methods are aligned with the intended learning outcomes of the subject.

Note 4: Assessment Method

This section should include the assessment method(s) to be used and its relative weighting, and indicate which of the subject intended learning outcomes that each method is intended to assess. It should also provide a brief explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes.

(Form AR 140) 8.2020