# The Hong Kong Polytechnic University
# Subject Description Form

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

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| **Subject Code** | CHC1M39 |
| **Subject Title** | Science and Civilisation in Pre-Modern China<br>中國古代科技與文明 |
| **Credit Value** | 3 |
| **Level** | 1 |
| **Pre-requisite/**<br>**Co-requisite/**<br>**Exclusion** | Exclusion: CC1M39, CC1M39P, CHC1M39P and CHC327 |
| **Objectives** | The aim of this subject is to acquaint students with a perspective of science on Chinese history and culture. With an exploration of how a body of empirical, practical, and theoretical knowledge developed in history and had influence on Chinese culture, students will be guided to see various aspects of science and civilisation in imperial China. Issues related to history, culture, art, agriculture, architecture, social structure, and gender, will be addressed. The following questions will be explored: the "Needham problem"; the diversity, advancement and application of technology in imperial China; How were inventions, craftsmanship, and embodied skills conceptualized in a hierarchical system that prioritized scholarly knowledge? Why have technology and science constituted an intrinsic part of Chinese history and culture? |
| **Intended Learning Outcomes**<br>*(Note 1)* | Upon completion of the subject, students will be able to:<br>a: have an in-depth understanding of the development of crucial technologies in imperial China and understand from a broader perspective that technologies had profound influence on Chinese culture in terms of art, aesthetics, trading, productive activities, everyday life, etc.;<br>b: understand key concepts of Chinese conceptualization of science, technology and culture;<br>c: gain new perspectives in evaluating the stereotypical misconception that labelled traditional Chinese technology as stagnated especially during the late imperial period;<br>d: increase historical sensitivity by observing the trajectory of technological innovations from traditional age to the present day;<br>e: develop analytical skills by textual study, hands-on activities, and visual-based analysis of web sources and museum sources;<br>f: meet the English reading and writing requirements. |

<table>
<tr><td>Subject Synopsis/ Indicative Syllabus<br>(Note 2)</td><td>1. Introduction: Conceptualizing Technology in Chinese History and Culture—Skill, Experience, Knowledge, Art, and a Way to Dao<br>2. Sciences of the Heaven and the Earth: Astronomical Observation, Geographical Exploration, and Cartography<br>3. Agriculture and the Farm-based Empire<br>4. Traditional Architecture: Geomancy, Building Wisdom and Scenery Appreciation<br>5. Medical Classics: Philosophy and Practice<br>6. Chemistry in Traditional China: Elixir, Alchemy, Ceramics, and Wine-making<br>7. Module System and Mass Production: Terracotta Warriors and beyond<br>8. Mechanical Instruments and Nature-powered Machines<br>9. Four Great Inventions and Their World-wide Influences<br>10. Scholars and Artisans: Craft, Commercials, and Social Status<br>11. Gender and Reproductive Technologies: Textile, Childbirth, and Household Management<br>12. Tasting Internationality: Introduction of Exotic Foods and Eating Habits in Imperial China<br>13. The High-level Equilibrium Trap: Why the Industrial Revolution Did Not Originate in China?</td></tr>
<tr><td>Teaching/Learning Methodology<br>(Note 3)</td><td>There will be two 50-minute lectures and one 50-minute tutorial each week. Textual, pictorial, audio, and video materials will be the teaching aids in the lectures. Students are required to prepare class readings before joining tutorial discussion and presentation. At the beginning of the semester students will select a topic or an issue concerning Chinese science and civilisation to study with and later deliver oral presentations in tutorials. Students are required to submit a written final essay developed from a self-selected topic and in accordance with the instructor’s suggestions.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes<br>(Note 4)</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td>f</td></tr>
<tr><td>1. Final Quiz</td><td>30<br>(including 10% for questions related to required readings)</td><td>√</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><td>√</td></tr>
<tr><td>3. Final Essay</td><td>40%<br>(10% graded by the ELC and 30% by the</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
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| | subject instructor) | | | | | | | |
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| Total | 100 % | | | | | | | |

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

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 1,500-2,500 words, done in accordance with the instructor's comments and feedbacks, 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. Students must obtain a D or above on the Writing Requirement assignment to pass the subject.

4. Students' participation in discussion in lecture and in tutorial is essential in ensuring students' engagement and understanding in depth.

| **Student Study Effort Expected** | | |
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| | 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**

**English required readings:**

Bray, Francesca. *Technology and Gender: Fabrics of Power in Late Imperial China* (Berkeley: University of California Press, 1997), pp. 173-272.

Elvin, Mark. "The High-level Equilibrium Trap: The Causes of the Decline of Invention in the Traditional Chinese Textile Industries," in W. E. Willmott, *Economic Organization in Chinese Society* (Stanford, California: Stanford University Press, 1972), pp. 137–172.

Needham, Joseph. The Grand Titration: Science and Society in East and West (London; New York: Routledge, 2013 [1969]), pp. 14-54, 190-217.

**English supplementary readings:**


Barbieri-Low, Anthony. *Artisans in Early Imperial China* (Seattle: University of Washington Press, 2007), pp. 3-30, 67-115.

Bray, Francesca. *Technology, Gender and History in Imperial China: Great Transformations Reconsidered.* New York: Routledge, 2013.

Burke, Peter. *A Social History of Knowledge,* Cambridge: Polity Press, 2000.

Clunas, Craig. *Superfluous Things: Material Culture and Social Status in Early Modern China* (Cambridge: Polity, 1991), pp, 141-165.

Clunas, Craig. *Superfluous Things: Material Culture and Social Status in Early Modern China.* Cambridge: Polity, 1991.

Elman, Benjamin. *On Their Own Terms: Science in China, 1550-1900.* Cambridge, Mass.: Harvard University Press, 2005.

Elvin, Mark. The Pattern of the Chinese Past. Stanford, California: Stanford University Press, 1973.

Eyferth, Jacob. *Eating Rice from Bamboo Roots: The Social History of a Community of Handicraft Papermakers in Rural Sichuan, 1920-2000.* Introduction & Chapters 1-3. Cambridge, Mass.: Harvard University Asia Center, 2009.

Flitsch, Mareile. "Knowledge, Embodiment, Skill, and Risk," *EASTS* 2, no. 2 (2008): 265-288.

Fong, Grace. "Female Hands: Embroidery as a Knowledge Field in Women's Everyday Life in Late Imperial and Early Republican China." *Late Imperial China* 25.1 (2004): 1-58.

Golas, Peter J. *Picturing Technology in China: From Earliest Times to the Nineteenth Century*. Hong Kong: Hong Kong University Press, 2015.

Hay, Jonathan. *Sensuous Surfaces: The Decorative Object in Early Modern China*. Honolulu: University of Hawaii Press, 2010.

Ko, Dorothy. *The Social Life of Inkstones: Artisans and Scholars in Early Qing China*. Seattle and London: University of Washington Press, 2017.

Ledderose, Lothar. *Ten Thousand Things: Module and Mass Production in Chinese Art.* Princeton: Princeton University Press, 2000.

Mann, Susan. "Work and Household in Chinese Culture: Historical Perspectives." In Barbara Entwisle and Gail Henderson, eds. *Re-drawing Boundaries: Work, Households, and Gender in China.* Berkeley, LA, London: University of California Press, 2000.

Needham, Joseph ed. *Science and Civilization in China* (especially Volume 2 [History of Scientific Thought], Volume 6, Part 2 [Agriculture] and Volume 5, Part 9 [Textile]). Cambridge University Press, 1984-.

Pomeranz, Kenneth. *The Great Divergence: China, Europe, and the Making of the Modern World Economy*. Princeton, Oxford: Princeton University Press, 2000.

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| | Ruitenbeek, Klaas. "An Early Treatise on Furniture Making: The *Lu Ban Jing*," in *Orientations: Chinese Furniture, 1984-1994*, pp. 125-129.<br><br>Schäfer, Dagmar. *The Crafting of the 10,000 Things: Knowledge and Technology in 17th Century China*. Chicago: The University of Chicago Press, 2011.<br><br>Sigaut, Franscois. "Technology," in Tim Ingold (ed.) *Companion Encyclopedia of Anthropology* (London; New York: Routledge, 1994), pp. 420-459.<br><br>Sivin, Nathan. "Why the Scientific Revolution did not Take Place in China- or Didn't It?" (revised version), in 李國豪、張孟聞、曹天欽編：《中國科技史探索》(香港：中華書局，2005 [1986]), pp. 97-114.<br><br>Smith, Pamela H. *The Body of the Artisan: Art and Experience in the Scientific Revolution*. Chicago: University of Chicago Press, 2004.<br><br>**Chinese readings (optional)：**<br><br>衣若蘭：《三姑六婆：明代婦女與社會的探索》。台北：稻香出版社，2002 年。<br><br>吳蕙芳：《明清以來民間生活知識的建構與傳遞》。台北：學生書局，2007 年。<br><br>李約瑟原著，科林·羅南改編，江曉原主持，上海交通大學科學史系譯：《中華科學文明史》（上冊）。上海：人民出版社，2010 年。（第一卷第六章及第十章）<br><br>李約瑟著，張卜天譯：《文明的滴定：東西方的科學與社會》。北京：商務印書館，2016 年。<br><br>李約瑟著，張養正等譯：《李約瑟文集：李約瑟博士有關中國科學技術史的論文和演講集，1944-1984》。沈陽：遼寧科學技術出版社，1986 年。<br><br>李貞德：《女人的中國醫療史——漢唐之間的健康照顧與性別》。台北：三民書局，2008 年。<br><br>李國豪、張孟聞、曹天欽編：《中國科技史探索》。香港：中華書局，1986 年。<br><br>杜石然、范楚玉、陳美東、金秋鵬、周世德、曹婉如：《中國科學技術史稿》。北京：科學出版社，1985 年。<br><br>林富士主編：《疾病的歷史》。台北：聯經出版事業有限公司，2011 年。<br><br>胡曉真、王鴻泰編：《日常生活的論述與實踐》。台北：允晨文化實業股份有限公司，2011 年。<br><br>孫機：《中國古代物質文化》。北京：中華書局，2014 年。<br><br>梁其姿：《面對疾病 ── 傳統中國社會的醫療觀念與組織》。北京：中國人民大學出版社，2012 年。 |

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| | 黃一農：《社會天文學史十講》。上海：復旦大學出版社，2004年。<br>劉鈍、王揚宗編：《中國科學與科學革命──李約瑟難題及其相關問題研究論著選》。瀋陽：遼寧教育出版社，2002年。<br>盧嘉錫主編：《中國古代科學技術史綱》。沈陽：遼寧教育出版社，1996年。 |

*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.