Professor Subodhana Wijeyeratne
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Purdue University, Department of History
HISTORY 641

HISTORIES OF SCIENCE AND TECHNOLOGY IN EAST ASIA, 1400-2000

Place and Time

Thursdays 1500-1750
Beering 1242

Course Goals

This course will explore the history of science through in-depth case studies of medieval innovation, Tokugawa-period science, and the 20th-century North Korean rocketry industry. This approach will be used in a comparative approach to understanding the diverse methodologies, questions, and historiographies of the human relationship with technological ideas, and the objects they generate.

Previous study of specific periods of history, culture or language is not required for this course.

Please notify me if you have a learning disability or have physical limitations that require accommodation. We will work together to develop a plan that suits your needs.

Required Texts

- Aldrich, Daniel P. *Site Fights: Divisive Facilities and Civil Society in Japan and the West*. Ithaca, NY: Cornell University Press, 2008.
- Burns, Susan L. *Kingdom of the Sick: A History of Leprosy and Japan*. Honolulu: University of Hawai'i Press, 2019.
- Chang, Iris. *Thread of the Silkworm* (New York, NY : Basic Books, 1995)
- Daston, Lorraine, and Peter Galison. *Objectivity*. New York: Zone Books, 2007.
- Edgerton, David. *The Shock of the Old: Technology and Global History since 1900*. London: Profile, 2008.
- Frumer, Yulia. *Making Time: Astronomical Time Measurement in Tokugawa Japan.* (Chicago; The University of Chicago Press, 2018)
- George, Timothy S. *Minamata: Pollution and the Struggle for Democracy in Postwar Japan*. Cambridge, MA: Harvard University Asia Center, 2001.
- Hawley, Samuel Jay. *The Imjin War: Japan's Sixteenth-Century Invasion of Korea and Attempt to Conquer China*. 1st ed. Seoul: Royal Asiatic Society, Korea Branch, 2005.
- Janetta, Ann Bowman. *The Vaccinators: Smallpox, Medical Knowledge, and the "Opening" of Japan.* Stanford: Stanford University Press, 2007
- McClellan, James E, and Harold Dorn. *Science and Technology in World History: An Introduction.* Maryland: Johns Hopkins University Press, 2006.

Contact

I can be reached at subowijeyeratne@gmail.com. Please note that if I receive messages after 1800 I may not be able to reply until after 0900 the next day. Notification of absence or requests for extensions should be communicated as soon as possible; messaging immediately before the deadline is generally unacceptable

except under extenuating circumstances.

Please take advantage of my office hours; I want to get to know you and I'm there to help. You may also email if you have questions or concerns, but I may not be able to respond to all emails. If it is important, please speak with me in person.

Emails exchanged between us will be professional communications and should therefore be composed politely and properly. This includes addressing them to me by my title and surname. Please do not message me as if composing a text to a friend. Explanations should be clear and concise. You will be expected to be polite and respectful of others in class.

Classwork

Grading for this class will be as follows:

- Read, write, and present sources: 40%
    - We will divide up the sources amongst participants at the beginning of class.
    - Each presentation should summarise the sources, identify strengths and weaknesses, identify historiographical content, and present major issues and themes within the documents that you regard as important.
    - You will also be expected to produce a **1500 word response paper** for your readings.
        - In terms of content, in addition to a proper understanding of the concepts, you will be evaluated on your understanding of the timelines involved. For major events you will be expected to know the year (but not necessarily the day or month). For broader trends, you will be expected to know the decade.
        - **All submissions should be formatted correctly and display proper grammar. For formatting, please see Purdue's OWL Guidance on formatting (https://owl.purdue.edu/owl/research_and_citation/mla_style/mla_formatting_and_style_guide/mla_general_format.html).**
            - **Look at the tabs on the page for details on how to correctly do citations.**
        - All submissions must have the following at the top, left-hand side of your submission:
            - The date
            - Your name
            - The course for which you are submitting the piece
            - My name
        - Students unable to complete an assignment by the due date should consult their instructor as early as possible to discuss an extension.
        - Extensions are not normally granted for reasons of work due in other courses or extra-curricular activities, but may be granted for reasons of illness or a death in the family. Any extension granted must be confirmed by email from the instructor. In no case will an extension of more than one week be granted. Students submitting written assignments late without an extension are penalised at the rate of one grade per day of lateness.

- Participation in discussions: 40%
    - Students who sleep, are consistently tardy, do not read the materials, and/or are otherwise not paying attention in class will see their behaviour impacting this mark. Subtracting marks is at the professor's discretion.
        - You will also be evaluated on your participation in discussions and ability to answer questions.
        - Attendance is not optional, but with prior notice you may miss one class without incurring any penalty. Except in the case of genuine and documented emergencies, such absences must be confirmed with me via email before class begins. Unpermitted absences will incur a -1 penalty per absence.
    - Please familiarise yourself with the university's policies on:
        - Academic honesty (www.purdue.edu/odos/osrr/academic-integrity/index.html)
        - Use of copyrighted materials (www.purdue.edu/policies/academic-research-affairs/ia3.html)
        - Attendance and other regulations (www.purdue.edu/studentregulations/regulations_procedures/classes.html)
- Presentation: 20%
    - Identify a contemporary technology that you believe will be of interest to historians in the future.
    - Identify the historiographical significance of the technology, based on the discussions in class.
    - You may choose when you wish to present.

All required work must be submitted in order to receive a final grade for the course.

Lectures and classroom discussions may not be recorded in any medium other than notes.

Professor Subodhana Wijeyeratne
swijeyer@purdue.edu

COURSE PLAN

Note on Pronunciations

a as in f***a***ther
e as in ***e***t c***e***tera
i as in magaz***i***ne
o as in n***o***te
u as in fl***u***te

Vowels with macrons (â, ê, î, ô, û ***or*** ā, ē, ī, ō, ū) are held longer than those without, but their sound values remain unchanged. The distinction is important. For example: *kôshô* means "negotiations," while *koshô* means "broken."

Part I: Introduction

Week 1: **Course Introduction**

- Structure and objectives of class
- Grading expectations

Week 2: **The Roots and Development of Modern Science and Technology**

- **Special Research Guidance: Mindy J. Williams.**
- **[Justin]** Lorraine Daston, and Peter Galison. *Objectivity*. New York: Zone Books, 2007.
- **[Claire]** McClellan, James E, and Harold Dorn. *Science and Technology in World History: An Introduction*. Maryland: Johns Hopkins University Press, 2006, pp.71-94, 268-296, 320-348

Week 3: **Theories of the History of Science and Technology**

- **[Secret]** Michael Polanyi, 'Republic of Science: Its Political and Economic Theory'
- **[Secret]** Boris Hessen, 'The Social and Economic Roots of Newton's Principia.'
- **[William]** Edgerton, David. *The Shock of the Old: Technology and Global History since 1900*. London: Profile, 2008.

Part I: Korea

Week 4: **Ships, Guns, and Nation-Building in 16th and 17th century Korea.**

- **[Justin]** Kenneth M. Swope, 'Crouching Tigers, Secret Weapons: Military Technology Employed during the SinoJapanese-Korean War, 1592-1598.'
- **[Justin]** Saeyoung Park, 'Memory, Counternarrative, and the Body Politic in Post-Imjin War Choson Korea.'
- **[Xiaoyang]** Hawley, Samuel Jay. *The Imjin War: Japan's Sixteenth-Century Invasion of Korea and Attempt to Conquer China*. 1st ed. Seoul: Royal Asiatic Society, Korea Branch, 2005.

Week 5: **South Korea and the Economics of Shipbuilding**

- **[Umme]** Ebrey, Patricia Buckley, and Anne Walthall. *Modern East Asia From 1600: A Cultural, Social, and Political History*, ch.28 'Korea (1945 to present).'

- **[Amy]** Wonchul Shin, 'The evolution of labour relations in the South Korean shipbuilding industry: a case study of Hanjin Heavy Industries, 1950-2014'

Week 6**: North Korea's Cult of the Missile**

- **[William]** Jinwung Kim, 'A History of Korea,' pp. 519-608
- **[William]** Daniel A. Pinkston, 'The North Korean Ballistic Missile Program.'
- **[William]** North Korean Propaganda Posters

Part II: China

Week 7: **Zheng He's Missing Treasures and the Problems of Shipbuilding History**

- **[Justin]** Church, Sally K., 'Zheng He: An Investigation into the Plausibility of 450-ft Treasure Ships.'
- **[Amy]** Elman, 'Naval Warfare and the Refraction of China's Self-Strengthening Reforms into Scientific and Technological Failure, 1865-1895.'
- **[Xiaoyan]** Chin-keong Ng, 'Maritime Frontiers, Territorial Expansion and Haifang (Coastal Defense) during the Late Ming and High Qing.'

Week 8: **Revolutionary Science in 20th century China**

- **[Umme]** Ebrey, Patricia Buckley, and Anne Walthall. *Modern East Asia From 1600: A Cultural, Social, and Political History*, ch.27 'China under Mao.'
- **[Xiaoyang]**Zuoyue Wang, 'The Cold War and Reshaping of Transnational Science in China.'
- **[Xiaoyang]** J.A. Modelski, 'Communist China's Challenge in Technology.'
- **[Xiaoyang]** Richard Baum, 'Chinese Science after Mao.'
- **[Claire]** Gregory Kulacki and Jeffrey G. Lewis, 'A Place for One's Mat: China's Space Program, 1956-2003.'

Week 9: **Hero Scientists and China's Space Program**

- **[Shriya]** Iris Chang, *Thread of the Silkworm* (New York, NY : Basic Books, 1995)
- **[Shriya]** "Report on Meetings Between Chinese and Soviet Representatives on Rocket Production," September 23, 1957, Wilson Center Digital Archive, RGAE f. 8157, op. 1, 1957, d. 1991, l. 77-80. Obtained and translated for CWIHP by Austin Jersild, accessed July 12, 2025, https://digitalarchive.wilsoncenter.org/document/116821.
- **[Shriya]** Nina Wang, 'The Making of an Intellectual Hero: Chinese Narratives of Qian Xuesen.'

Week 10**: HALF-TERM BREAK**

Part III: Japan

Week 11**: Medicine as Social Subversion in Edo Japan**

- **[Secret]** Janetta, Ann Bowman. *The Vaccinators: Smallpox, Medical Knowledge, and the "Opening" of Japan.* Stanford: Stanford University Press, 2007.
- **[Secret]** Burns, Susan L. *Kingdom of the Sick: A History of Leprosy and Japan*. Honolulu: University of Hawai'i Press, 2019.

Week 12**: The *Yamato:* From Militarized Science to Military Science Fiction**

- **[Claire]** Walter E. Grunden. *Secret Weapons and World War II: Japan in the Shadow of Big Science.* (Lawrence: University Press of Kansas, 2005)
- **[Claire]** Ebrey, Patricia Buckley, and Anne Walthall. *Modern East Asia From 1600: A Cultural, Social, and Political History,* ch.26 'War and Aftermath in Japan.'
- **[Justin]** Hiromi Mizuno, 'When Pacifist Japan Fights: Historicizing Desires in Anime.'
- **[Justin]** Malcolm Muir, Jr, 'Rearming in a Vacuum: United States Navy Intelligence and the Japanese Capital Ship Threat, 1936-1945.'

Week 13: **Technology and its Diseases in Modern Japan**

- **[Amy]** George, Timothy S. *Minamata: Pollution and the Struggle for Democracy in Postwar Japan.* Cambridge, MA: Harvard University Asia Center, 2001.
- **[Shriya]** Aldrich, Daniel P. *Site Fights: Divisive Facilities and Civil Society in Japan and the West.* Ithaca, NY: Cornell University Press, 2008.

Week 14**: Japan's Space Program and its Socio-Economic Parallels**

- **[Umme]** Yasushi Sato, 'A Contested Gift of Power: American Assistance to Japan's Space Launch Vehicle Technology, 1965-1975.
- **[Secret]** Hirotaka Watanabe, 'The Evolution of Japanese Space Policy: Autonomy and International Cooperation.'
- **[Umme]** Subodhana Wijeyeratne, *Of Rockets and the Rising Sun,* ch. 8-9.

Part IV: Global Context

Week 15: **Traditions of Knowledge**

- **[William]** McClellan, James E, and Harold Dorn. *Science and Technology in World History: An Introduction.* Maryland: Johns Hopkins University Press, 2006, p.71-114, 160-194
- **[Shriya]** Engler, Steven. "'Science' vs. 'Religion' in Classical Ayurveda." Numen 50, no. 4 (2003): 416–63.
- **[Shriya]** Bhargava, Pushpa M., and Chandana Chakrabarti. "Of India, Indians, and Science." *Daedalus* 118, no. 4 (1989): 353–68.

Week 16**: Rocketry on the Subcontinent**

- **[Justin]** Harrison, Todd, et al. *Space Threat Assessment 2020.* Center for Strategic & International Studies, 2020.
- **[Justin]** Simon Werrett. "Technology on the Spot: The Trials of the Congreve Rocket in India in the Early Nineteenth Century." *Technology and Culture 53*, no. 3 (2012): 598–624.
- **[Secret]** Krige, John, et al. *NASA in the World: Fifty Years of International Collaboration in Space.* 1st ed. 2013., Palgrave Macmillan US, 2013. Ch. 11-12.