

# WGS-2020: WOMEN, SCIENCE AND TECHNOLOGY

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## Cuyahoga Community College

**Viewing: WGS-2020 : Women, Science and Technology**

**Board of Trustees:**

January 2022

**Academic Term:**

Fall 2024

**Subject Code**

WGS - Women and Gender Studies

**Course Number:**

2020

**Title:**

Women, Science and Technology

**Catalog Description:**

Study of the historical participation and exclusion of women from the gendered realms of science, technology, engineering, and mathematics (STEM). Course examines the gendered discourses and rationale around scientific knowledge, power, and the gendered body. This course places emphasis on the experiences of women in the Western STEM fields. Students will apply feminist science studies and critiques to understand and assess both historical and contemporary challenges regarding women in the fields of science, women's health care and sexuality, women's experiences in the fields of contemporary technology and engineering industries.

**Credit Hour(s):**

3

**Lecture Hour(s):**

3

## Requisites

**Prerequisite and Corequisite**

WGS-1510 Introduction to Women's Studies; or ENG-1010 College Composition I, or concurrent enrollment; or ENG-101H Honors College Composition I, or concurrent enrollment.

## Outcomes

**Course Outcome(s):**

Analyze and evaluate feminist science studies and critiques as they apply to the realms of scientific and technological developments.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Examine through primary and secondary resources the feminist critiques and gendered theories of science.
2. Trace the historical development and evolution of the "sciences" focusing on gender.
3. Evaluate the appearance and claims of "objective science" as it pertains to all genders.
4. Discuss and evaluate feminist critiques of education as they pertain to science, medicine and technology.
5. Describe a current scientific controversy employing feminist scholarship and terminology.

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**Course Outcome(s):**

Question the meanings of "scientific expertise" and investigate their effects on public policy (law and society) to the detriment of women.

**Essential Learning Outcome Mapping:**

Cultural Sensitivity: Demonstrate sensitivity to the beliefs, views, values, and practices of cultures within and beyond the United States.

**Objective(s):**

1. Examine the history of science and technology as a cultural force in our society.
2. Create a basic timeline of major scientific developments and the changing nature of research.
3. Evaluate women's role and power in the creation of scientific knowledge and technological development.
4. Identify factors influencing women's opportunities and participation in the sciences.
5. Utilize on-line research skills through visits to museums, library and scientific collections to reveal public responses to medical and scientific professionals.

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**Course Outcome(s):**

Examine the specific gendered application of science and technology with regards to the fields of Health and Medicine.

**Essential Learning Outcome Mapping:**

Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

**Objective(s):**

1. Classify current biological understandings of men's and women's bodies.
2. Examine the historical and philosophical arguments designating women's body as "other."
3. Evaluate the "science" of medical and socially prescribed "motherhood".
4. Assess feminist critiques of female sexuality and the "medicalization" of the LGBTQ+ population.
5. Analyze the racialized medicalization of the "Black Body".
6. Interpret the history of gynecology in relation to enforced slavery and forced sterilization.

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**Course Outcome(s):**

Assess the roles of gender and race in the field of technology.

**Essential Learning Outcome Mapping:**

Cultural Sensitivity: Demonstrate sensitivity to the beliefs, views, values, and practices of cultures within and beyond the United States.

**Objective(s):**

1. Apply feminist critiques of decolonial theory concerning gender, race, and technology.
2. Compare and contrast industrial development (tools, appliances, costs) based on gendered constructs.
3. Compare and contrast STEM education curriculum, funding, and opportunities between men and women.
4. Measure the gendered and racialized experiences of women in the Gaming and Tech industries.

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**Course Outcome(s):**

Apply interdisciplinary terminology, concepts and theories to analyze, compare, contrast, evaluate and summarize information on gender, science and technology.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Survey historical, philosophical, sociological, anthropological, psychological and literary studies of science.
2. Critically appraise public media images.
3. Evaluate bias in purportedly 'objective' documents, data, tests, books, internet, etc.

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**Course Outcome(s):**

Utilize and apply scientific theory and terminology in analysis of gendered constructs, particularly with regards to the role of women in STEM.

**Essential Learning Outcome Mapping:**

Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

**Objective(s):**

1. Analyze examples of pervasive gendered scientific dogmas.
  2. Interpret the use of language and concepts linking "objectivity," "professionalism," and gender.
  3. Evaluate and discuss the conceptualization and impact of "expertise".
  4. Trace changes in the nature and authority of scientific research through comparative historical analysis.
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**Methods of Evaluation:**

1. Student research and report on a specific scientific or technology profession, experiment or policy using gender theory, demographic and statistical data from primary and secondary sources.
2. Read and evaluate of a professional publication in the fields of Science, Engineering, Medicine, or Technology to describe the gendered application of science and technology.
3. Presentation or leading class discussion on a particular aspect of women's experiences in the STEM fields.
4. Written Assignments to develop research skills and critical evaluation of issues:
  - a. Compare and contrast various feminist science theories.
  - b. Chronologies of scientific disciplines, short biographies of women scientists.
  - c. Interpretation of gender bias in public laws or research protocols.
  - d. Analysis of current issues dealing with the application of technology and/or delivery of health care (Example: pregnant women and biohazards in the workplace; use of genome research with regard to human embryos; delivery and priorities of healthcare)
5. Journal: reflection and/or collection of examples of topical issues and events.
6. Student created podcast or video on course related topic.
7. Discussion Board.
8. Quizzes and exams.

**Course Content Outline:**

1. Introduction and reflections on women, science, gender, and history
  - a. Historiography of science and technology--overview
  - b. Power and "expertise" in modern society
  - c. Gender Theory and Feminist critique of science
  - d. Role of government in framing "science"
  - e. Role of education in shaping cultural and social norms
  - f. Resources and terminology
2. Gender and religion in the origins of science
  - a. Early Civilizations & views of science in medicine, astronomy, engineering
    - i. Egypt
    - ii. Greek and Roman
    - iii. Christianity & Western thought
  - b. Childbirth & Motherhood – relationships and medicine
    - i. Mother earth & power
    - ii. Childbirth and Ceasarian Section
    - iii. Priests, physicians & midwives
  - c. Interplay between religion, science and education
    - i. Monasteries & convents
    - ii. Universities
    - iii. Apprenticeships
3. The Scientific Revolution and its impact on women.
  - a. Renaissance enlightenment thought and science.
  - b. Scientific theory and the emergence of research.
  - c. Limits on women's education and participation in scientific research
  - d. Religion, gendered roles & science
  - e. Woman vs technology: Mary Shelly's "Frankenstein"
4. Medical and scientific view of women
  - a. Women as patient: diseases & medical conditions
    - i. Childbirth
    - ii. Distemper - Victorian fragility

- iii. Feminist theory – “Women as Other”
- iv. Origins of gynecology rooted in slavery and abuses of the female Black Body and Puerto Rican forced sterilization
- 5. Professionalization in science
  - a. Conceptualization of “expertise”
  - b. Educational opportunities and limits
  - c. Licensure – public policy and gender
- 6. Modern Science and Women
  - a. The ladies of the Harvard Observatory
  - b. The female human “computers”, coders, during WW II and for NASA
  - c. Women and the Manhattan project
  - d. Female anthropologists
  - e. Development of feminist science studies
- 7. Contemporary medical and scientific view of women
  - a. Women as patient: diseases & medical conditions
    - i. Childbirth
    - ii. Women’s health
    - iii. LGBTQ Theory
    - iv. Women as participants in medical research
- 8. Industry, technology and the ‘hard’ sciences
  - a. Contemporary statistics on women’s participation in STEM
    - i. Math, Engineering, and Technology
    - ii. Working realities for female employees and executives in these industries.
    - iii. Gendered bias in tech platforms
    - iv. Non-traditional pathways to IT
    - v. Structuring interest in society and in education to promote STEM fields
  - b. Gendered work, safety and public policy
- 9. Contemporary Images and Opportunities
  - a. Feminist science approaches to globalism
  - b. Climate crisis
  - c. Ecofeminism and sustainability

## Resources

Watts, Ruth. *Women in Science: A Social and Cultural History*. London. Routledge. , 2007.

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Wyer, Mary; Barbercheck, Mary; Cookmeyer, Donna; Orun Ozturk, Hatice and Marta Wayne. Editors. *Women, Science & Technology: A Reader in Feminist Science Studies*. . 3rd Edition. London. Routledge., 2014.

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Guthrie, Julian. *Alpha Girls: The Upstarts Who Took On Silicone Valley’s Male Culture And Made the Deals of a Lifetime*. New South Wales. Currency Press, 2019.

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Hayden, Judy A. ed. *The New Science and Women's Literary Discourse: Prefiguring Frankenstein*. NY: Palgrave MacMillan, 2011.

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Nimura, Janice. *The Doctors Blackwell: How Two Pioneering Sisters Brought Medicine to Women - And Women to Medicine*. New York: Norton, 2021.

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D'Ignazio, Catherine and Klein, Lauren. *Data Feminism*. Boston. M.I.T. Press, 2020.

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Perez, Caroline Criado. *Invisible Women: Data Bias In A World Designed For Men*. London. Harry N. Abrams Publisher,

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Sobel, Dava. *The Glass Universe: How the Ladies of the Harvard Observatory Took the Measure of the Stars*. New York City, Penguin Books., 2017.

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Padua, Sydney. *The Thrilling Adventures of Lovelace and Babbage: The (Mostly) True Story of the First Computer*. New York City, Penguin Group, 2016.

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Skloot, Rebecca. *The Immortal Life of Henrietta Lacks*. Boston, Gale/Cengage, 2010.

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Cabot, Heather and Walravens, Samantha Parent. *Geek Girl Rising: Inside the Sisterhood Shaking Up Tech*. London, St. Martin's Press, 2017.

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## Resources Other

### Books:

Burton, June K., foreword by Susan P. Conner. *Napoleon and the Woman Question: Discourses of the Other Sex in French Education, Medicine, and Medical Law 1799-1815*. Lubbock, TX: Texas Tech University Press, 2007.

Canel, Annie, Ruth Oldenziel, and Karin Zachmann, eds. *Crossing Boundaries, Building Bridges: Comparing the History of Women Engineers, 1870s-1990s*. London ; New York: Routledge, 2005.

Cowan, Ruth Schwartz. *A Social History of American Technology*. NY: Oxford University Press, 2017, Second Edition.

Green, Monica. *Making Women's Medicine Masculine: The Rise of Male Authority in Pre-modern Gynaecology*. NY: Oxford University Press, 2008.

Harding, Sandra. *Whose Science, Whose Knowledge?: Thinking from Women's Lives*. Ithica, NY: Cornell University Press, 1991.

Harding, Sandra. *The Postcolonial Science and Technology Studies Reader*. Durham, NC: Duke University Press. 2011.

Jahren, Hope. *Lab Girl*. New York City: Vintage Books. 2017.

Jardins. Julie des. *The Madame Curie Complex : The Hidden History of Women in Science*. New York, NY : Feminist Press at the City University of New York, 2010.

Jacobi, Mary Putnam & Carla Bittel. *The Politics of Medicine in Nineteenth-Century America*. Chapel Hill: University of North Carolina Press, 2009.

- Keller, Evelyn Fox and Longino, Helen. eds. *Feminism and Science*. Oxford: Oxford University Press, 1996.
- McMullin. *Age, Gender, and Work: Small Information Technology Firms in the New Economy*. Vancouver: UBC Press, 2011.
- Merchant, Carolyn. ***Ecological Revolutions: Nature, Gender, and Science in New England***. Chapel Hill: UNC Press, 2010.
- Rossiter, Margaret. *Women Scientists in America, Struggles and Strategies to 1940*. Baltimore: Johns Hopkins University Press, 1982.
- Schiebinger, Londa. *Has Feminism Changed Science?* Cambridge: Harvard University Press, 1999.
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## Articles:

- Armstrong, Victoria. "Hard bargaining on the hard drive: gender bias in the Music Technology Classroom." *Gender & Education*. July 2008, Vol. 20 Issue 4, p375-386.
- Cozza, Michela. "Bridging Gender Gaps, Networking in Computer Science." *Gender, Technology & Development*. July 2011, Vol. 15 Issue 2, p319-338.
- Cozzens, Susan E. "Gender Issues in US Science and Technology Policy: Equality of What?" *Science & Engineering Ethics*. 15 September 2008, 14(3): pp. 345-56.
- Fountain, Jane. "Constructing the information society: women, information technology, and design." *Technology in Society* Volume 22, Issue 1 ([http://www.sciencedirect.com/science/?\\_ob=PublicationURL&\\_hubEid=1-s2.0-S0160791X00X00206&\\_cid=271744&\\_pubType=JL&view=c&\\_auth=y&\\_acct=C000228598&\\_version=1&\\_urlVersion=0&\\_userid=10&md5=971e8e8e8e8e8e8e8e8e8e8e8e8e8e8e](http://www.sciencedirect.com/science/?_ob=PublicationURL&_hubEid=1-s2.0-S0160791X00X00206&_cid=271744&_pubType=JL&view=c&_auth=y&_acct=C000228598&_version=1&_urlVersion=0&_userid=10&md5=971e8e8e8e8e8e8e8e8e8e8e8e8e8e8e)) January 2000, Pages 45-62.
- Herring, Susan C.; Marken, James A. "Implications of Gender Consciousness for Students in Information Technology". *Women's Studies*. Apr/May 2008, Vol. 37 Issue 3, p229-247.
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- Venkatesh, Viswaneth. "Why Don't Men Ever Stop to Ask for Directions? Gender, Social Influence, and their Role in Technology Acceptance and Usage Behavior." *MIS Quarterly* Vol. 24, No. 1, Mar. 2000 (<http://www.jstor.org/stable/i363342/>) p. 115-139.
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- Xu, Yonghong. "Gender Disparity in Stem Disciplines: A Study of Faculty Attrition and Turnover Intentions." *Research in Higher Education*; Nov 2008, Vol. 49 Issue 7, p607-628.

## Websites:

1. The Untold History of Women in Science and Technology: <https://obamawhitehouse.archives.gov/women-in-stem> (<https://obamawhitehouse.archives.gov/women-in-stem/>)
2. Black Girls Code: <https://www.blackgirlscode.com/>
3. Medical experimentation on the female Black body. <https://www.npr.org/2017/02/07/513764158/remembering-anarcha-lucy-and-betsey-the-mothers-of-modern-gynecology>

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