

Biology

Course: Biology

Group of courses: Mathematics, Natural Sciences

Provided by: PD Dr. Kerstin Palm

Last edit: PD Dr. Kerstin Palm, October 2018

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Course objectives:

Students should be enabled to develop a serious, non-sexist, empirically and theoretically founded understanding of the biology of all genders. In particular, studies should impart:

- knowledge of central theories, concepts, discussions and methods of biology-related gender studies and their application to historical and current biological contents and methods as well as to individual research
- an interdisciplinary understanding of the different dimensions of gender and their complex relations and interactions (physical materiality, identity, social structure, symbolic order) awareness of how biological research is related to social context from historical and current perspectives

Teaching content/subject-specific gender studies content:

Subject areas: Biology-related gender studies or gender-informed biology refers to almost all current areas of biology such as zoology, botany, cell biology, genetics, physiology, endocrinology, etc. The main areas of research are brain research and evolutionary biology.

Methodical and theoretical approaches:

A distinction is made between two central, mutually informative perspectives:

- a. the internal level, intervening methodologically and with regard to content and
- b. the metatheoretical gender-based science research focusing on the humanities and social sciences

Concerning a.: At the internal level of biology, biological experts critically review biological practice and theory building to determine whether an androcentric or sexist bias violates scientific methodological standards to such an extent that, following a careful revision of the current state of research, a redefinition of biological hypotheses and theories or completely new biological studies become necessary. Understanding the research results at this level requires a good knowledge of biological subject contents and methods. This level conveys a high sensitivity towards the mechanisms that remain unnoticed in conventional research processes, which bring about a structuring of biological research through social assumptions/gender ideologies, and enables them to be criticised and overcome through careful biological research. Scientific studies in that sense in various fields have been carried out by, e.g.: Anne Fausto-Sterling (developmental biology), Bonnie Spanier (molecular biology), Sarah Richardson (genetics), Malin Ah-King (evolutionary biology), Ruth Bleier (neurobiology), Anelis Kaiser (neuropsychology), Lynda Birke (physiology, ecology), Linda Fedigan (primate research), Patricia Gowaty (evolutionary biology), Ruth Hubbard (various research areas), Rebecca Jordan-Young (neuropsychology), Cordelia Fine (neuropsychology), Giordana Grossi (neurobiology), Deboleena Roy (neurobiology) and many others.

Concerning b.: At the level of social or cultural science research, biological theory building and practice are subject to epistemological, historical, social science and cultural science analyses using humanities and social science methods in order to identify the meaningful processes in the development of body theories in connection with social power relations. Accordingly, good theoretical and methodological knowledge in the humanities and social sciences is required for this approach. Important conventional

and current studies, some with extensive historical insights into the dynamics of power and knowledge in the life sciences, have been carried out by Londa Schiebinger, Donna Haraway, Claudia Honegger, Evelyn Fox Keller, Thomas Laqueur, Heinz-Jürgen Voß, Emily Martin, Nelly Oudshoorn, Victoria Pitts-Taylor, Celia Roberts and many others.

Both levels are mutually interdependent with regard to interdisciplinary exchange. The study of both perspectives requires a high level of inter- and transdisciplinary competence, which must be conveyed in the courses accordingly.

Fields of practice:

Against this background, new gender-informed research in biology develops new questions, research concepts, methodological approaches and interpretations of empirically collected data that lead to a more complex biopsychosocial perspective on gender, gender differences and sexuality in biology. In particular, awareness of the dependence of physiological processes on social and cultural environments (embodiment phenomena) leads to more profound gender-based empiricism, diagnostics, therapy and prevention in medical and health science research areas. The embodiment perspective also overcomes the nature/nurture dispute (Are sexual characteristics congenital or acquired?). Instead of one-sided biological or culturalistic perspectives on gender characteristics, the focus is rather on the mutual influence and inextricable combination of biological, social and cultural factors.

Aspects of professionalization:

Epistemology: Insight into the social context dependency of scientific research activities, including those in the natural sciences, counteracts a naive belief in science and the ideology of scientism and strengthens the ability to ensure a high quality of biological research in a responsible and self-critical manner.

Content: Gender-informed biological research overcomes a reductionistic-biologistic and ideologically distorted view on gender and gender differences and establishes an empirically more adequate perspective on gender corporeality in interdisciplinary cooperation with other professional approaches. Embodiment phenomena through stimulus-dependent brain plasticity, context-dependent epigenetics and environmentally-induced hormone regulation, etc. allow new approaches to the material modes of existence of gender as a result of the interplay of social, physiological and cultural factors.

Integration of gender studies content into the curriculum:

Although the topic "biology of genders" in the sense of a "gender-informed physical materiality of gender differences" concerns and enriches all areas of biology/gender studies as a cross-sectional topic, it is recommended to teach this topic in specific gender modules or teaching units (e.g. introductory courses) due to the complexity of interdisciplinary theoretical and methodological didactics.

These modules/teaching units are open to students of natural sciences, humanities and social sciences, health sciences/medicine (e.g. as elective modules) and/or can be integrated into gender studies (e.g. in subject areas/modules on the body, scientific criticism/epistemology, history of science, public health, gender studies in biology). For the quality assurance of biological research, it makes sense to integrate gender aspects into qualification work in biology, e.g. by means of certified project-related practice modules or by means of support cooperation between biological and gender-informed

specialists.

Examples of introductory courses:

- Introduction to gender studies in biology using the example of brain research
- Introduction to gender studies in biology using the example of hormone research
- Introduction to gender studies in biology using the example of evolutionary biology

Using these central research areas of biology as vivid examples, studies of gender-informed biology as well as humanities and social sciences gender studies will examine questions of the history, epistemology and context-related theory dynamics of biology. Students will be provided with

1. concrete biological and humanities/social science research results,
2. central concepts, technical terms, theories of biology-related gender studies, and
3. trans- and interdisciplinary competence by reflecting on specialist cultures, methods and different potentials of critique

Examples of in-depth courses:

- Lecture "Gender-informed history of biology"

The history of biology provides insight into the context-dependent theory dynamics of biology. Introducing research results from historical gender research can add gender-related aspects.

- Seminar "A critical view on gender-specific aptitudes"

Brain research and natural science-oriented psychology widely deal with gender-specific aptitudes, e.g. with regard to spatial imagination, linguistic talent, empathy or systemic thinking. Gender-informed neurobiology and neuropsychology have detected a striking number of violations of scientific methodological standards in this popular-scientifically effective area, which will be presented in the seminar. This will not only promote competence in the quality assurance of empirical research, but will also challenge the natural reality of many gender differences the public believes to be scientifically proven.

- Seminar "Menopause – gender-political dimensions of a medical concept"

From antiquity to modern times, the "menopause" in medical literature has been related equally to the male and female body. At the beginning of the 19th century, this concept was initially described more in terms of men, then changed to the female body as the female menopause, and around 1900 it again tended to affect both sexes. Also in the 20th and 21st centuries, characteristic changes of classification occurred again. The seminar reconstructs the historical background of the changing gendering of the climacteric concept and the associated gender-political implications. Using the example of this concept, the context dependency, value-ladenness and social effectiveness of gender concepts in life science are illustrated.

- Seminar "Sexualities in the biomedical debate"

How does biology currently conceptualise sexuality and which theories on homo- and transsexuality exist? The seminar identifies the heterogeneous debates, theories and practices in medicine and biology on this topic in primary and secondary contemporary texts in the history of biology, medicine,

cultural and social sciences. Using this example, it explores the character of a key life science concept structured by changing biological theories, medical practices and social conceptions.

Degree Stage:

Due to the differences in gender studies and biology curricula, a distinction with regard to the integration of biology-related gender studies in study courses must be made for both subjects:

Gender Studies: Introductory courses and first in-depth courses at Bachelor's level; advanced in-depth courses based on these courses at Master's level

Biology: Since most biology curricula often only offer the possibility of studying biology-related gender studies as elective modules, limited to a few courses, only introductory courses or basic in-depth studies are possible at both Bachelor's and Master's level. In the advanced study phases (Bachelor's/Master's thesis, PhD) gender aspects can be added to current biological research work by specific consultations and supervision.

It would be desirable to enhance the status of gender issues in biology as compulsory elective courses in a compulsory gender module and/or to have the possibility of obtaining certificates for introductory and in-depth gender courses as a specific qualification in biology.

Basic Literature/Recommended Reading:

- Ah-King, Malin (2014). Genderperspektiven in der Biologie. Marburg.
- Bluhm, Robyn, Anne Jaap Jacobson, und Heidi Lene Maibom, Eds. (2012). Neurofeminism. Issues at the intersection of feminist theory and cognitive science. New York.
- Fausto-Sterling, Anne (2012). Sex/gender. Biology in a social world. New York/Oxon.
- Haraway, Donna (1995). Die Neuerfindung der Natur: Primaten, Cyborgs und Frauen. Frankfurt/M., New York.
- Jordan-Young, Rebecca M. (2010). Brain storm. The flaws in the science of sex differences. Cambridge.
- Richardson, Sarah (2013). Sex itself. The search for male and female in the human genome. Chicago/London.
- Mayberry, Maralee, Banu Subramaniam, und Lisa H. Weasel, Eds. (2001). Feminist science studies – A new generation. New York/London.
- Schiebinger, Londa (1993). Schöne Geister. Frauen in den Anfängen der modernen Wissenschaft. Stuttgart.
- Spanier, Bonnie B. (1995). Im/partial Science. Gender Ideology in molecular Biology. Bloomington/Indianapolis.
- Voß, Heinz-Jürgen (2010). Making sex revisited. Dekonstruktion des Geschlechts aus biologisch- medizinischer Perspektive. Bielefeld.

Journals:

- Ariadne – Forum für Frauen- und Geschlechtergeschichte. | [Website](#)

- Feministische Studien: Zeitschrift für interdisziplinäre Frauen- und Geschlechterforschung. | [Website](#)
- Feminist Theory: An International Interdisciplinary Journal. | [Website](#)
- Freiburger GeschlechterStudien. | [Website](#)
- Hypatia: A Journal of Feminist Philosophy. | [Website](#)
- Gender: Zeitschrift für Geschlecht, Kultur und Gesellschaft. | [Website](#)
- Signs. Journal of Women in Culture and Society. | [Website](#)
- Open Gender Journal OGJ. Open Access Journal. | [Website](#)
- Science, Technology, & Human Values. | [Website](#)
- Social Studies of Science. | [Website](#)
- Neuroethics. | [Website](#)
- rhizomes. Cultural studies in emerging knowledge. | [Website](#)
- International Journal of Gender, Science and Technology. | [Website](#)
- Gender Medicine. | [Website](#)