

REPRODUCTIVE SCIENCE AND MEDICINE

Degree Types: MS

The master of science in reproductive science and medicine (MS-RSM) is a full-time, terminal master of science degree focusing on human reproductive biology and medicine. We offer thesis and non-thesis tracks to meet the needs of our applicants and their professional goals. Students will also be part of a vibrant community of reproductive scientists through the Center for Reproductive Science (<https://www.crs.northwestern.edu/>).

A majority of program courses and activities are located on the Northwestern University Chicago campus in Illinois, USA. However, the program is cross-campus and some core courses, electives, and thesis research opportunities are located on the Northwestern University Evanston campus and the Stanley Manne Children's Research Institute, also in Illinois, USA. University shuttles connect the campuses and are free to students.

Program graduates will be prepared for research and technical positions with academic, clinical, and pharmaceutical laboratories. Students will also have a foundation for further training to PhD and medical degree programs.

Additional Resources:

- Department website (<https://www.crs.northwestern.edu/education/reproductive-science-training/ms-rsm/>)
- Program handbook(s) (<https://northwestern.app.box.com/s/g6o7yv05tcjygygpj975y1h64f0t5/>)

Degrees Offered

- Reproductive Science and Medicine MS (<https://catalogs.northwestern.edu/tgs/reproductive-science-medicine/reproductive-science-medicine-ms/>)

Reproductive Science and Medicine Courses

REPR_SCI 405-0 Female Reproductive Physiology and Endocrinology (1 Unit)

A lecture-based course that provides a comprehensive survey of the structure and function of the female reproductive system. Throughout the quarter, students will discuss the fundamentals of female reproductive anatomy and reproductive axis function (hypothalamus-pituitary-gonadal). Specific topics that will be covered include: female sex determination and differentiation, reproductive hormone signaling and action, the ovarian and menstrual cycles, oogenesis and folliculogenesis, pregnancy and parturition, and female reproductive technologies.

REPR_SCI 406-0 Emerging Research in Reproductive Science and Medicine (1 Unit)

This is a primary literature and critical thinking-based course designed to challenge students with historical, contemporary, and emerging concepts in reproductive science and medicine.

REPR_SCI 407-0 Male Reproductive Physiology and Endocrinology (1 Unit)

A lecture-based course that provides a comprehensive survey of the structure and function of the male reproductive system. Throughout the

quarter, students will discuss the fundamentals of male reproductive anatomy and reproductive axis function (hypothalamus-pituitary-gonadal).

REPR_SCI 415-0 Medical Management of Fertility: From Contraception to ART (1 Unit)

This is a lecture and laboratory course that exposes students to assisted reproductive technologies (ART), embryology, and andrology. Course topics include gamete and embryo biology, assisted reproductive techniques and associated technologies, ethics, and an introduction to fertility clinic operation.

Prerequisites: REPR_SCI 405-0 and REPR_SCI 407-0.

REPR_SCI 420-0 Human Reproductive Health and Disease (1 Unit)

Major disorders of the male and female reproductive system are covered. The molecular basis, pathophysiology, and current status of research and treatment are considered. Topics include sexual function and dysfunction, infertility, reproductive aging, reproductive cancers, endometriosis, uterine leiomyoma, and pregnancy complications.

Prerequisites: REPR_SCI 405-0 and REPR_SCI 407-0.

REPR_SCI 425-0 Responsible Conduct of Research in Reproductive Science (1 Unit)

This course provides instruction and guidance on the responsible conduct of research. NIH defines the responsible conduct of research as the practice of scientific investigation with integrity. The responsible conduct of research involves the awareness and application of established professional norms and ethical principles in the performance of all activities related to research. Students will receive instruction and discuss a variety of topics required to perform high quality research with integrity, transparency, rigor, and reproducibility from experts in these areas and faculty conducting reproductive science research.

REPR_SCI 430-0 Translational Topics in Fertility Preservation and Oncofertility (1 Unit)

Topics include fertility preservation in different populations (adult women and men, pediatrics, transgender and disorders of sex development (DSD) populations), tissue/cell processing methods (gamete and gonad harvesting, processing, cryopreservation, and storage), clinical care (patient navigation conversations, consults, cancer agent risk factors, psychological factors), fundamental biology techniques (bioengineering gonadal bioprotheses, spheroids, microphysiologic platforms, follicle culture), and ethical issues in the field.

REPR_SCI 440-0 Reproductive Technologies Laboratory (1 Unit)

This is an intensive laboratory-based course designed to provide students with exposure to a range of topics and associated technologies used in reproductive science and medicine.

REPR_SCI 442-0 Reproductive Research I (1 Unit)

This laboratory course is specifically designed to lead students through a hypothesis driven, discovery based research project stemming from current research questions in reproductive science including but not limited to: factors important to reproductive organ development, signaling pathways that inform reproductive organ structure and function, and molecular and cellular pathways implicated in reproductive disease.

Prerequisites: REPR_SCI 405-0, REPR_SCI 407-0, REPR_SCI 425-0.

REPR_SCI 443-0 Reproductive Research II (1 Unit)

This course is a continuation of REPR_SCI 442-0. REPR_SCI 443-0 will shift to advancing data acquisition and analysis, expanding project design directions and enhancing oral and written scientific communication.

Prerequisites: REPR_SCI 405-0, REPR_SCI 407-0, REPR_SCI 425-0, and REPR_SCI 442-0.

REPR_SCI 455-0 Science Communication in Reproductive Science and Medicine (1 Unit)

This course is designed to increase students' confidence and competence in oral and written science communication, with a focus on written research proposals. Students will learn how to communicate complex topics in reproductive science and medicine to broad audiences and highlights the importance of "story-telling," as a tool to engage audiences, convey research significance, and obtain research funding.

REPR_SCI 497-0 Assessment and Career Planning (1 Unit)

This course is designed to provide students with skills and resources to evaluate themselves in light of their career and professional goals. Students receive instruction on self-assessment and professional development planning. This course does not specifically prepare students for any one career. Rather, recognizing that professional development is a continuous process, this course provides students the skills and resources to uncover their unique strengths relevant to the professional world of reproductive science and medicine.

REPR_SCI 591-0 Thesis Research in Reproductive Science and Medicine (1-3 Units)

During this course, students will prepare a written thesis describing their research project including the research question/hypothesis, rationale and significance, a literature review, experimental approach, data and results, and future directions.

Prerequisite: REPR_SCI 595-0.

REPR_SCI 595-0 Research in Reproductive Science and Medicine (1-3 Units)

Students will become integrated members of their laboratory or research group and commit a minimum of 20 hours per week to research.

Research mentors will evaluate student research commitment and progress and assign the grade for the course.