2023-24

GENETIC COUNSELING

Degree Offered: Master of Science

Program Description

This program offers a Master of Science degree in Genetic Counseling, through the Medical College of Wisconsin Graduate School. The program is a full-time, day program with one cohort of 10 students beginning each fall term. The duration is 21 months in length, consisting of four fall/spring terms with one intervening summer term session. The program curriculum consists of 56 term credits, including coursework, clinical practicums, and a research thesis. Students who successfully complete the program will be eligible for the American Board of Genetic Counseling (ABGC) certification examination.

The Genetic Counseling Master of Science Program at the Medical College of Wisconsin will prepare the next generation of genetic counselors to be diverse leaders at the forefront in the delivery of precision health.

Admission Requirements

In addition to the general Graduate School admission requirements, this program has additional specific requirements.

Applicants must have a bachelor's degree. Although a specific major is not required, most applicants have a degree in a biological or social science (e.g., biology, genetics, biochemistry, sociology, social work).

A minimum undergraduate grade-point average (GPA) of 3.00 or a master's degree with a minimum cumulative GPA of 3.00 is required. If a student has an undergraduate GPA less than 3.0, coursework completed after graduation demonstrating a higher GPA will be considered.

Prerequisites listed below must be completed with a grade of C or better, prior to the program start date. Applications will still be considered with coursework pending. College credit for high school Advanced Placement courses do not satisfy the requirement.

Prerequisite course work includes one semester each of the following:

- Genetics
- Statistics
- Biochemistry
- Social Science

An applicant must complete courses in biochemistry, statistics, genetics, and a social science (such as psychology, sociology, women's studies, philosophy, ethnic studies, etc.). We encourage students to take as many courses as possible relevant to genetic counseling to strengthen their application. All required courses should be taken prior to applying as it is difficult to evaluate courses "in progress" at the time of application.

For additional information pertaining to the admissions process and requirements, we encourage you to check out the MSGC Program Website.

Credits Required to Graduate

56 credits

Required Courses

20241 Translational Genomics. *3 credits.*
The primary goal of this course is to teach students how to develop a research program to ask relevant genetic questions in the clinical setting utilizing the molecular genetics toolbox. To this end, students will be provided with background in molecular genetics strategies and study designs as well as an understanding of common genetics questions emanating from the clinic so that they will be better able to make connections between bench and bedside. In addition, they will be challenged to think creatively and through a translational focus during course-long case studies and group projects.

40110 Bioethics in Precision Medicine. *3 credits.*
This course will explore the historical, philosophical, rhetorical, and ethical foundations of precision medicine and analyze the bioethical issues raised by this new medical paradigm as they manifest in a variety of clinical, biomedical, and health policy context.

40130 Human Development and Prenatal Genetics. *2 credits.*
Students will be introduced to the various aspects of prenatal genetics including normal and abnormal pregnancy and fetal development. Students will become familiar with genetic testing and screening options that are used to investigate risk for genetic conditions in pregnancy and appropriate clinical applications of these tests. Using maternal, familial, and fetal factors, population data, and genetic screening and testing results, students will formulate personalized risk assessments. Topics such as infertility, pregnancy loss, termination, and other pregnancy management options will be explored. Students will appreciate the psychosocial elements specific to prenatal genetic counseling and continue to develop skills in presenting information in a balanced manner.

40140 Cancer Genomics. *2 credits.*
This course will familiarize students with hereditary cancer syndromes and the underlying causes of cancer. The interdisciplinary care of cancer patients will also be explored through case-based study. Students will gain knowledge of various cancer risk assessment models and genetic testing options. Students will incorporate genetic test results with personal and family history information to create a personalized risk assessment for a variety of indications. Students will learn to appreciate different psycho-social considerations affecting families with cancer.

40145 Medical Genomics. *3 credits.*
This course aims to familiarize students with a medical genetics evaluation typical to what would be seen in the pediatric or adult genetics clinic. Students will appreciate the interprofessional collaboration required for the diagnosis and management of children and adults with complex disease. Students will be introduced to a plethora of genetic conditions spanning multiple disease categories. A differential diagnosis and genomic testing plan will be formulated using information gathered from thorough chart review, birth, family, and developmental histories, and the physical exam. Students will be able to determine the clinical significance of genetic testing results.

40150 Genetic Counseling I: Skills and Practice. *2 credits.*
Students will be introduced to the history and evolution of the genetic counseling profession. Students will be oriented to fundamental genetic counseling skills including pedigree construction, pedigree analysis, case preparation, contracting, documentation and risk assessment. Students will begin to consider legal, ethical, social and cultural issues related to genetic counseling and be encouraged to explore their own values and biases. Development and adaptation of oral and written communication skills to various audiences will be applied through course assignments and case-based learning. Students will be introduced to professional issues such as credentialing, professional development and lifelong learning.

40155 Genetic Counseling II: Theory and Practice. *2 credits.*
This course prepares students to conduct a full genetic counseling session including case preparation, facilitation of session components and follow-up. Students will expand upon their interviewing skills develop case conceptualization ability and hone their patient education skills. Through standardized patients and in class role play, students will learn to recognize psychosocial aspects of the genetic counseling session and apply their counseling skills. Students will engage in course activities to further develop their communication abilities (oral and written), apply advanced risk assessment, and examine professional boundaries. Students will have the opportunity to enhance personal skill development through the giving and receiving of feedback with peers and supervisors.

40156 Genetic Counseling III: Psychosocial Issues. *2 credits.*
This course builds on Genetic Counseling 2: Theory and Practice by further exploring psychological aspects of the genetic counseling process. Students will learn to apply counseling theories in the development of their clinical communication skills. Students will learn to integrate client factors including cultural, socioeconomic, emotional, behavioral, gender, and educational status into the genetic counseling session. Students will develop more advanced techniques to address the psychosocial impact of a genetic condition on the family, complex family dynamics and unique issues that may occur in genetic counseling. Continued professional development will be emphasized by exploration of personal strengths, limitations, values, and biases as they relate to genetic counseling.

40157 Genetic Counseling IV: Advanced Topics. *2 credits.*
This course will prepare students for life beyond the classroom with a focus on honing skills needed to become an independent successful genetic counselor. Students will develop an appreciation for the growth of the genetic counselling field and for life-long learning inherent in the profession. Discussion of current and emerging topics will put students in a position to become leaders in the field. As future practitioners in their communities, students will appreciate the scope and complex nature of health disparities and embrace cultural humility. In addition, students will also develop habits to build resilience necessary for personal growth and self-care.

40160 Research Methodologies & Informatics. *2 credits.*
This course is designed to build a foundation to help students formulate and execute their research thesis topics. Students will learn about a variety of research methodologies, including quantitative and qualitative approaches. As part of this course, students will gain experience identifying and critically reviewing scientific literature and get exposure to the use of informatics tools. They will learn to evaluate research hypotheses and identify various aspects of the research process, including study design, data management and analysis.

Throughout this course there will be an emphasis on conducting research responsibly, ethically, and with integrity. We will highlight various opportunities that genetic counselors have for research involvement. This introductory course aims to instill the value of research as it applies to the practice of genetic counseling, and its implications for the community.

40203 Molecules to Cells for Genetic Counselors. *3 credits.*
This course is designed to provide students with necessary background knowledge in cell biology, molecular genetics, biochemistry, and embryology as it pertains to clinical genetics. There will be emphasis on the clinical relevance of these topics and how abnormalities in these cellular processes can lead to human disease. In addition, students will be introduced to different genetic and biochemical testing and screening options that are commonly used to diagnose genetic disorders.

40293, 40295, 40296,40297, 40298 Clinical Practicum I-V. *3 credits.*
The overall goal of clinical practicums is to develop genetic counseling skills, acquisition of the genetic counseling practice-based competencies, prepare students to enter the workforce, and be able to operate successfully in a variety of different roles and specialties. The clinical practicums will be facilitated by the Director of Fieldwork Training and will be based on curriculum schedule along with clinical supervisor and clinic schedule. Students are required to complete five clinical rotations with the program. There are 4 clinical specialty placements and 1 elective rotation. The core clinical placements are in pediatrics, prenatal, oncology, and other adult specialty. Throughout the practicum, students will apply their knowledge in a supervised clinical setting and will participate in clinical cases. Each Clinical Practicum will consist of 16 total clinic days (8 hours per day) under the supervision of a certified genetic counselor under a specific area of practice. Students may begin to document participatory cases in their logbook in this practicum. Students will be expected to progress from beginning level of proficiency to intermediate and advanced levels in as many domains as possible within the practiced-based competencies as defined by the Accreditation Counseling for Genetic Counseling. These students will train in clinical settings in a developmental fashion to acquire a set of skills to become competent in all aspects of genetic counseling. They will be expected to spend 8-hour days in clinical sites unless other arrangements have been made or approved by clinical supervisors. The rotation is planned with the primary clinical supervisor. Students will receive formal evaluation throughout the practicum by their supervisors at 2 different time points throughout the rotation with their primary supervisors as well as the Director of Fieldwork Training. They will establish goals for each rotation and expectations alongside their clinical supervisor to help them attain growth towards the practice-based competencies. Students will also participate in various case conferences and tumor boards as part of their supplemental fieldwork experiences.

40294 Laboratory Practicum. *3 credits.*
The purpose of the laboratory practicum is to introduce students to the many different types of tests involved in clinical as well as research genetics, to start to develop the skills necessary to understand and communicate genetic testing strategies and results, and to encourage students to think about the roles genetic counselors can play in the testing process. This practicum will function as a "rotation" with students moving through different experiences in small groups. The practicum will expose students to different molecular, cytogenic, and biochemical tests and help them develop an understanding for how these tests are performed and when they are appropriate. Students will have the opportunity to see how an individual sample moves from the point of collection through the laboratory and ultimately

into a research or clinical report for several specific testing modalities, helping them to think about how to explain the testing process to patients, providers, and other audiences. Students will also learn about how genetic testing has changed over time and how genetics professionals adapt to those changes. Finally, students will be encouraged to explore the different ways genetic counselors are involved in the testing process through interviews, field trips, and other experiences.

40299 Genetic Counseling Research Thesis. *1-3 credits.*
Thesis credits are required for program completion. The culminating experience for students in the MCW MS Genetic Counseling Program is a formal thesis research project focused on the practice of genetic counseling in which she or he participated in the design, execution, data analysis, and write-up. Working on the research thesis allows students to develop skills that enhance intellectual development and critical, flexible thinking. Our research program is driven by the interests of the individual student and takes advantage of the wide variety of genomics initiatives across our MCW community and the state of Wisconsin. The timeline for the thesis project begins in the Fall of the first year in the Research Methodologies & Informatics Course when students identify a research question they are interested in studying, complete a comprehensive literature review on the subject, and identify a thesis advisor(s). Continuation of the research process happens within this Research Thesis Course throughout the rest of the Program. Students will secure a Thesis Committee comprised of their primary thesis advisor (Committee Chair) and two additional faculty members. The Committee will approve the project in advance, will provide guidance and supervision of the project, and will critique and approve the final thesis. Students present their results in local and regional forums, including the Genetic Counseling Colloquium in the final semester of the Program near graduation, and are strongly encouraged to submit their findings as abstracts to regional or national conferences, and for publication.

40301 Genetic Counseling Seminar. *1 credit.*
This course promotes lifelong education for the profession of genetic counselling through exposure to interdisciplinary events and engagement in community activities. Students will give effective presentations tailored to a variety of audiences. Students will identify community engagement opportunities to promote a deeper understanding of patient experience

Required Courses as Needed

40002 Research Thesis Continuation. *0 credits.*
This is a form of registration available to students who have completed all of the required coursework, including thesis credits but have not yet completed the writing of the Thesis. Continuation status is limited to three consecutive terms following the completion of Thesis credits.

Notes

MSGC Curriculum Overview

1st Year

Fall Term	
Molecules to Cells for GCs	3
GC1: Skills & Practice	2
Research Methods & Informatics	2
GC Seminar	1
Laboratory Practicum	3
Total Term Credits	11

Spring Term	
Human Development & Prenatal Genetics	2
GC2: Theory & Practice	2
Translational Genomics	3
Cancer Genomics	2
GC Seminar	1
Research Thesis	1
Total Term Credits	11

Summer Term	
Medical Genomics	3
Clinical Practicum I (8 weeks)	3
Research Thesis	2
Total Term Credits	8

2nd Year

Fall Term	
Bioethics in Precision Medicine	3
GC3: Psychosocial Issues	2
GC Seminar	1
Clinical Practicum II (8 weeks)	3
Clinical Practicum III (8 weeks)	3
Research Thesis	2
Total Term Credits	14

Spring Term	
GC4: Advanced Topics	2
GC Seminar	1
Clinical Practicum IV (8 weeks)	3
Clinical Practicum V (8 weeks)	3
Research Thesis	3
Total Term Credits	12