



GENETIC COUNSELING PROGRAM

UNIVERSITY OF MICHIGAN



**PROGRAM PROSPECTUS:
ADMISSIONS FOR
FALL 2022**

The University of Michigan Master's in Genetic Counseling program is accredited by the Accreditation Council for Genetic Counseling (ACGC), located at 7918 Jones Branch Drive, Suite 300, McLean, VA 22102 USA, www.gceducation.org. ACGC can be reached by phone at 913.222.8668.

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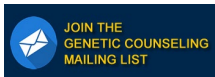
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INTRODUCTION

Greetings from the University of Michigan Genetic Counseling Program. We have created this prospectus to help you learn more about graduate training at the University of Michigan. If you have questions about any of the information in this booklet or would like some additional information, please contact us at UMGenetics@umich.edu and/or visit our website at:

<https://medicine.umich.edu/dept/human-genetics/education/genetic-counseling-program>.

Please also look for the following button on our website to sign up for our mailing list so that you can receive updates about activities related to our program.



Our faculty and students welcome visits (in-person or remote) from prospective applicants to discuss the profession and our training program. If you are going to be in the Ann Arbor area, please let us know so we can set up a time to meet on campus. Alternatively, we may be able to identify an alumnus who would be able to talk with you closer to your own home.

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The University of Michigan Master's in Genetic Counseling program is accredited by the Accreditation Council for Genetic Counseling (ACGC), located at 7918 Jones Branch Drive, Suite 300, McLean, VA 22102 USA, www.gceducation.org. ACGC can be reached at 571-762-4375 or info@gceducation.org.

GENETIC COUNSELING

Genetic Counseling is a dynamic, challenging and rapidly growing profession. Graduate study in genetic counseling combines course work in molecular genetics and genomics, medical genetics and genomics, and counseling techniques with mentored clinical internships and research activities. This course of study provides students with a broad knowledge base in basic, translational, and applied genetics and genomics and communication, counseling, and professional skills that are essential to their success as genetic counselors over the course of their careers. Graduates of genetic counseling training programs typically receive a Master of Science. Genetic counselors work in a variety of settings, including adult, cancer, cardiovascular, pediatric, and prenatal genetics clinics; specialty clinics (e.g. cystic fibrosis, muscular dystrophy, disorders of sex development, etc.); public health genetics programs; commercial genetic testing laboratories; human genetics research; public policy; the biotechnology industry; and human genetics education.

For more information on the field of genetic counseling, please refer to the websites of the National Society of Genetic Counselors (www.nsgc.org), the American Board of Genetic Counseling (www.abgc.net), the Association of Genetic Counseling Program Directors (agcpd.org) and the Accreditation Council of Genetic Counseling (www.qceducation.org).

THE UM GENETIC COUNSELING PROGRAM

In 1956, the first genetics clinic and the first Department of Human Genetics in the United States were established at the University of Michigan. The Master's Degree Program in Genetic Counseling was founded here in 1979. This makes it one of the most well-established programs in the country and exemplifies our long history of innovation in clinical service and education in genetics and genomics. Our faculty is composed of outstanding educators who are leaders in the field. Members of our faculty created the first genetic counseling textbook *A Guide to Genetic Counseling*. A second edition was published in 2009 and is the most commonly used resource by graduate training programs in the Americas and internationally.

The vision of the University of Michigan Genetic Counseling Program is to train genetic counselors that are able to meet the current challenges and to help shape the future of genetic counseling and genomic medicine.

Our mission is to provide an individualized, integrated, and supportive graduate training environment comprised of:

- **A comprehensive and rigorous academic curriculum**
- **Diverse clinical experiences in traditional and cutting edge genetics and genomics settings**
- **A broad spectrum of research opportunities that supports the development of genetic counseling clinical scholars**

Most importantly, our graduate training program is responsive to the interests and unique needs of individual students. The program accepts up to 10 students per year for admission.

The Genetic Counseling Program is located within the [Department of Human Genetics](#), a basic science department of the Medical School, and has strong affiliations with multiple clinical departments and schools on the Michigan campus. These include the [Rackham Graduate School](#), the [University of Michigan Medical School](#), the [University of Michigan Health System](#) and the [Schools of Public Health](#) and [Social Work](#), all of which are ranked in the top 10% of programs nationally.

Our core curriculum takes full advantage of our affiliation with a basic science department; genetic counseling students receive the same training as the PhD students in the foundations of genetics and have multiple opportunities to work with faculty involved in cutting edge research in genetics and genomic medicine. Concurrently, the students are also engaged in counseling skills classes taught by genetic counselors, social workers, and psychologists. Students begin their clinical work in the first semester of training and participate in an integrated sequence of increasing case management and counseling responsibilities that permits them to rapidly develop independence and confidence as clinicians.

Our innovative course of study in the medical, scientific and counseling aspects of human genetics/genomics and genetic counseling supports the development of critical thinkers with integrated analytic and clinical skills. Our graduates emerge as extremely well rounded genetic counselors who are ready to meet the current challenges in clinical genetic medicine and are able to help guide the evolving practice of genetic counseling and genomic medicine.

We provide a comprehensive and highly supportive educational environment. For the three most recent classes of students (2019, 2020, and 2021 graduates), the degree completion

rate is 100% (0% attrition) and job placement in a genetic counseling or related position is 100%. Graduates of our program also perform extremely well on the national genetic counseling certification examination. The cumulative ABGC Certification Exam pass rate for 1st time test takers in the past three years (Classes of 2018, 2019, and 2020) is 96% and for the past five years (Classes of 2016, 2017, 2018, 2019, and 2020) is 97%. 100% of our graduates from this cohort have achieved board certification.

While our program is housed with the University of Michigan Medical School, it is administered jointly with the [Rackham School of Graduate Studies](#) and is fully accredited by The Accreditation Council for Genetic Counseling (ACGC). Our graduates are eligible for certification in Genetic Counseling by the ABGC and enjoy exceptional employment opportunities in a variety of settings throughout the country. Information about professional licensure for genetic counselors and our graduates can be [read here](#). Many of our alumni have achieved national recognition for their leadership roles, both within the genetic counseling community and the medical genetics community at large.

PROGRAM LEADERSHIP

Beverly M. Yashar, M.S., Ph.D., Program Director, Professor obtained her PhD in genetics from the University of North Carolina-Chapel Hill and her MS in Genetic Counseling from the University of Michigan. She has worked in a wide variety of genetics settings including basic research labs, clinical genetics clinics and a family studies core. Her research interests include the development and implementation of genomic based health care and communication and decision-making in genetic counseling. She is involved in curriculum development, teaching in multiple classes and seminars, directing the thesis training track and providing direct mentorship to all trainees. Beverly is a co-editor of the 2nd edition of *A Guide to Genetic Counseling*, a 2013 inaugural member of the Michigan League of Educational Excellence, current member of the steering committee for Michigan's Academy of Medical Educators, a past President of the American Board of Genetic Counseling and the Association of Genetic Counseling Program Directors.

Monica Marvin, M.S., Associate Program Director, Associate Professor obtained her Master's Degree in Genetic Counseling from the University of Michigan in 1994. Prior to returning to the University of Michigan in 2005, she worked in a variety of clinical settings including prenatal, pediatrics, and adult genetics at New Jersey Medical School and Spectrum Health in Grand Rapids, MI. Monica works with the Assistant Program Director to coordinate clinical activities, teaches classes, mentors research, and is involved in curriculum development. She is a past President of the Michigan Association of Genetic Counselors and was the 2011 Chair of the National Society of Genetic Counselors Access and Service Delivery Committee. She was the 2014 Chair of the National Society of Genetic Counselors Payor Subcommittee and received the 2014 Strategic Leader award by the National Society of Genetic Counselors. She also served on the Board of Directors for the National Society of Genetic Counselors in 2016 and 2017. She was instrumental in the 2018 passage of legislation to license genetic counselors in the state of Michigan.

Beth Dugan, M.S., C.G.C., Assistant Program Director, Clinical Instructor obtained her Master's Degree in Genetic Counseling from Case Western Reserve University in 2001. Beth joined our leadership team as Assistant Program Director in 2019 with extensive experience in prenatal genetics, teaching, and clinical supervision. For over 15 years, Beth provided prenatal genetic counseling services for patients in Detroit and at U-M's Fetal Diagnostic Center. More recently, Beth worked with Mainstream Genomics, a start-up that creates digital health tools to increase the knowledgeable and appropriate use of genetic testing. There, she helped develop online patient education tools and performed market research to understand how healthcare professionals decide to use genetic services. Beth

works with the Associate Program Director to coordinate clinical activities, teaches classes, provides student mentorship, and assists in curriculum development.

Jeffrey Innis, M.D., *Medical Director, Professor* obtained his M.D. degree at the University of Miami and completed his genetics residency and fellowship at the Baylor College of Medicine. Dr. Innis is certified in pediatrics and clinical genetics. His research interests focus on understanding the mechanisms that lead to congenital anomalies involving the limbs and urogenital tract. Dr. Innis teaches in multiple classes taken by our students and supports students during clinical rotations.

FACULTY

A diverse and expert group of faculty contributes to our classroom teaching, clinical training, and research program. The expertise, accessibility, and support provided by our faculty are strengths noted by our students, alumni, and peers.

The University of Michigan is home to a rich and well-established community of clinical genetic counselors, physicians, and research geneticists working at the cutting of genetics and genomics. These individuals are highly qualified educators with first-hand knowledge and experience in a wide variety of content areas that are essential to training the next generation of genetic counselors.

Our students also train with multiple affiliated clinical faculty (both genetic counselors and physicians) who work in a wide variety of clinical settings outside of the University of Michigan Health System.

CURRICULUM OVERVIEW

The University of Michigan program is structured to provide students with individualized training that supports the development of comprehensive genetic counseling skills through early clinical involvement and strong didactic course work. The Michigan program is a two-year program composed of five consecutive semesters. Students enter in the fall and graduate 20 months later in April.

The program is designed so that, with the exception of the third semester (summer), students participate in coursework, clinical training, research, and wide variety of supplemental activities every semester, allowing for complementary learning opportunities. The summer is devoted to clinical training and the initiation of the research thesis.

Specific degree requirements for students matriculating in 2022 include:

- A minimum of 59 credit hours (see table on next page)
- Completion of graduate study with a cumulative grade point average of at least a B (3.0) in all graduate courses that are applied towards the master's degree.
 - The course of study must include the required courses listed under coursework (or their equivalent) and at a minimum 3 electives in relevant educational disciplines/fields for a minimum of 7 credit hours. At least one of these electives must be in the School of Public Health.
 - For all courses required for the degree in Genetic Counseling, the minimum grade is a B-. If a B- is not achieved, remediation will be required.
- Successful completion of six clinical internships for a minimum of 8 credit hours and four Clinical Skills Checkpoints culminating in the achievement of clinical competence.
- Presentation of one student seminar (in HG 821 or 822) and one formal presentation in Medical Genetics Grand Rounds, the Departmental Retreat, or a similar venue.
- Completion and presentation of your research thesis (see Research Project).

Credit Requirements for Students Matriculating in 2021

Fall Y1		Fall Y2	
HG541 (Molecular genetics)	3 Credits	HG544 (population genetics)	2 Credits
HG640(GC skills I + peer supervision)	3 Credits	HG649 (GC skills III and peer supervision)	3 Credits
HG641(Repro genetics)	2 Credits	HG650 (Medical genetics)	1 Credit
HG642 (Research skills)	1 Credit	SW 617 (Death loss and grief)	3 Credits
HG821 (Student Seminar)	1 Credit	HG800 (research)	3 Credits
HG647 (Anatomy/Embryology for GCs)	3 Credits	Elective*	2 Credits
HG659 (clinical internship)	1 Credit	HG659 (Clinical Internship)**	3 Credits
WINTER Y1		WINTER Y2	
HG542 (Molecular Basis Human Disease)	3 Credits	HG651 (medical genetics)	1 Credit
HG643 (Research skills)	1 Credit	HG652 (GC skills and peer supervision)	3 Credits
HG644 (Applied GC)	1 Credit	HG800 (research)	3 Credits
HG645 (Cancer GC)	2 Credits	Elective*	2 Credits
HG646 (Pediatric GC)	1 Credit	HG659 (Clinical Internship)**	2 Credits
HG648 (GC skills + peer supervision)	3 Credits		
HG822 (student seminar)	1 Credits		
Elective*	3 Credits		
HG659 (Clinical Internship)	2 Credits		
Total: 59 Credits			

**Total elective credit hours must be 7 at a minimum. The distribution of the courses and credits is flexible.*

*** The distribution of clinical credit hours per semester in the final year of training is flexible.*

For dual degree trainees, some of the clinical credits will be accrued during the summer between their second and third year of training.

COURSE WORK

Educational training in the Michigan program prepares students to face the current and future demands of the rapidly evolving fields of genetic counseling, human genetics and genomics. Coursework provides students with a comprehensive understanding of the medical, scientific, counseling and ethical aspects of these disciplines and supports the development of critical thinkers with integrated analytical and clinical skills.

The core curriculum takes full advantage of our affiliation with a basic science department and provides students with extensive training in molecular and applied medical genetics. Genetic counseling students receive the same training in the foundations of human genetics and the development of new genetic and genomic technologies as PhD students, and the medical genetic class is a required course for our physicians training in the Medical Genetics Fellowship Program.

Genetic counseling classroom training covers both applied and theoretical aspects of genetic counseling practice and is taught by experienced clinicians. Classroom teaching is highly interactive and utilizes multimedia approaches that include role plays with peers, faculty, and professional actors, and supervision groups that are led by both peers and senior genetic counselors. Our small class sizes allow individual attention to each student's needs and supports a nurturing academic environment.

Genetic counseling classroom work and clinical training at Michigan are sequenced to provide an integrated approach to the development of clinical skills. In each academic semester, didactic and clinical training occur simultaneously and are complementary. This allows students to immediately begin applying the concepts they are discussing in their coursework to their clinical training. Students are also concurrently utilizing the classroom to begin working on advanced clinical skills.

In every semester, students also have the opportunity to consider ethical dimensions of clinical practice and the intersections between the clinical and public faces of genetic counseling and genetics, including the translation of research into the diverse practice of health care services, policy initiatives and public health genetics. Lastly, electives provide students with the opportunity to train in a wide variety of complementary disciplines (e.g. public health, psychology, social work, and nursing).

REQUIRED COURSES BY SEMESTER

SEMESTER I (fall)

[HG541] Molecular Genetics: This course provides training in current molecular genetic investigation. Introductory lectures cover recombinant DNA and molecular genetic methodology, stressing overall experimental strategies. A combination of classic and current papers accompanies the lecture material (1-2 papers per lecture), supported by readings from recent texts (particularly *Recombinant DNA: Genes and Genomes*, Watson et al., 3rd Ed.). Learning is complemented by a weekly discussion section. The course explores current understanding of genome and gene structure and regulation, relying on both historical and the most current research methods. Topics include replication and mutagenesis, genes and transcription, RNA processing and translation and the epigenome. Content is explored in relationship to cancer, evolution, and integrative genomics. In addition to a college-level introductory biology class, a more advanced class in either genetics or biochemistry is a required prerequisite for this course.

[HG640] Genetic Counseling Seminar I: Clinical Skills/Peer Supervision Group: This seminar introduces first year genetic counseling students to the basic clinical tools employed in a general genetics setting including: case preparation; obtaining family, pregnancy, health, and developmental histories; communicating inheritance patterns; team approaches to service delivery; medical documentation; laboratory services; community resources; genetic support groups; and risk assessment and management. This material is taught through both lectures and interactive class activities.

A first year genetic counseling student peer supervision group supplements this weekly class. This component supports the development of clinical genetic counseling skills through case presentations and discussions of case management. Discussion of specific student cases (both typical and atypical) between students and faculty is used to support the development of skills in communication, critical thinking, interpersonal counseling, psychosocial assessment, and professional ethics.

[HG641] Reproductive Genetics: This course provides an understanding of reproductive genetics and the skills necessary for case preparation and management in this critical component of clinical practice. All aspects of reproductive genetic counseling are covered including prenatal testing, maternal screening, teratogen exposures, ultrasound evaluation, carrier testing, pregnancy loss, and pregnancy termination.

[HG642] Research Skills: This year-long course, continued into semester II as HG643, provides students with an overview of the research process and emphasizes fundamental skills needed in both quantitative and qualitative research. The material considered in this class enables students to understand and evaluate critical elements in the practice of research and to develop skills in hypothesis generation, data acquisition, analysis, and interpretation. This work enables identification and development of each student's graduate thesis.

[HG647]: Anatomy and Embryology for Genetic Counselors: This semester-long course is designed to provide an overview of the major anatomical systems of the human body. This novel course uses an innovative approach to incorporate clinical problems relevant to the work of genetic counselors to develop an improved understanding of embryology, anatomy, and their applications to clinical practice

[HG659] Clinical Internship: See clinical training.

[HG821] Student Seminar: This course is designed to increase student knowledge in the newest genetics-related research. Students choose a publication and are paired with a faculty mentor to develop a presentation both on the publication as well as current research in that area. With their mentor, students develop skills in critical analysis, group discussion and public speaking. Genetic counseling students typically observe in the first semester.

SEMESTER II (winter)

[HG542] Molecular Basis of Human Genetic Disease: HG542 emphasizes the principles and methods of genetics and molecular genetics as they relate to human disease. The course covers the topics of monogenic traits, complex genetic disorders, non-Mendelian inheritance, copy number variants, and cancer genetics. In each section, principles of genetics are explored via human genetic diseases. Papers from the current and classic literature supplement lecture material. HG541 is a prerequisite for this course.

[HG643] Research Skills: This is a continuation of Research Skills from semester I and continues to help students both identify topics of interest for their research projects and begin study design. This process is heavily mentored by program faculty, with the ultimate goal of creating a research proposal to guide work over the summer.

[HG644] Pediatric Genetics and Interdisciplinary Care: HG644 is a half-semester course that provides an orientation to an interdisciplinary model of care that is typically required by patients seen in a pediatric genetics clinic. Topics covered include pediatric and adolescent development, case management, interpreting sequence variants and copy number variants, parent perspectives, multidisciplinary care, newborn screening, and counseling on uncertainty.

[HG645] Cancer Genetics: Our Cancer Genetics course provides an introduction to the cancer genetics specialty. Covered topics include the biology of cancer, inherited colorectal cancer syndromes, inherited breast/ovarian cancer syndromes, rare inherited cancer syndromes, genetic counseling for cancer risk, and genetic testing for cancer syndromes. Students also learn and practice the use of risk assessment models.

[HG646] Applied Clinical Genetics: This half-semester course focuses on risk assessment and factors to consider when ordering a genetic test. Topics covered include pedigree analysis, Bayesian analysis, overview of genetic testing and cytogenetic methodologies, practice guidelines for different genetic tests and insurance coverage. Predictive genetic testing and ethical issues raised by genetic testing are also discussed. Actual cases are used in this course and students are encouraged to include some of their own clinical cases for discussion.

[HG648] GC Seminar II-Placing the Client Front and Center / Peer Supervision Group: This seminar is for first year genetic counseling students and is focused on the development of genetic counseling skills. Students work on developing interviewing skills that will help them identify and use the client's reality to develop a counseling relationship. Topics include: developing an empathetic connection, delivering bad news, dealing with difficult clients, and multicultural counseling. This highly interactive class allows students to explore the topics from their personal and clinician perspectives and relies on a multimedia approach to learning.

This weekly class is supplemented by a peer supervision group consisting of first and second year students. This component supports the development of clinical genetic counseling skills through case presentations and discussions of case management. Discussion of specific student cases (both typical and atypical) between students and

faculty is used to support the development of skills in communication, critical thinking, interpersonal counseling, psychosocial assessment, and professional ethics.

[HG659] Clinical Internship: See clinical training.

[HG822] Student Seminar: See description from semester I. In semester II, genetic counseling students typically give a presentation.

SEMESTER III (summer)

No course work and no tuition. Students complete two seven-week full time clinical rotations and also work on their research thesis.

SEMESTER IV (fall)

[HG544] Basic Concepts in Population and Statistical Genetics: The concepts and analytic methods for studying variation in human populations are the subject matter of this course. The topics covered include the distribution of genetic variation, major forces of genetic stasis and change, quantitative traits, linkage analysis, association tests, and the role of the environment. A problem solving-based approach is the basis for learning in this class that explores basic models of population, quantitative, and statistical genetics at a mathematical level appropriate to students in the life sciences. The focus is on current human genetics research. However, most of what is presented is broadly useful and applies to natural populations of other species.

[HG649] Genetic Counseling Seminar III-Advanced Counseling Skills / Peer Supervision Group: This seminar focuses on the psychotherapeutic aspect of genetic counseling by exploring theories of short-term, relationship-based, client-centered, and family system counseling. Simulated patient sessions allow students to work in real-time on their counseling techniques.

This weekly class is supplemented by a peer supervision group for second year students. This component supports the development of clinical genetic counseling skills through case presentations and discussions of case management. Discussion of specific student cases (both typical and atypical) between students and faculty is used to support the development of skills in communication, critical thinking, interpersonal counseling, psychosocial assessment, and professional ethics.

[HG650] Medical Genetics: This year-long course covers the basic principles of medical genetics and their application to clinical medicine. Topics include a broad spectrum of genetic conditions ranging from chromosome disorders (e.g. sex chromosome disorders, microdeletion syndromes) and monogenic conditions (e.g. cystic fibrosis, Ehlers-Danlos syndromes, Wilson's disease) to complex genetic conditions (e.g. psychiatric disorders) that illustrate principles of medical genetics.

[HG659] Clinical Internship: See clinical training.

[SW617] Death, Loss & Grief: This course examines philosophical, cultural, and religious views pertaining to death. Cultural and age variations in preparing and responding to death and dying are also explored. SW617 also examines cognitive and emotional reactions to death and dying by individual family members, and gives special attention to adaptations presented by caretakers.

[HG800] Research: See research section.

SEMESTER V (winter)

[HG651] Medical Genetics: Part II of our year-long course on the basic principles of medical genetics and their application to clinical medicine. See HG650 for more description.

[HG652] Genetic Counseling Seminar IV. Professional Development/Peer Supervision Group (3 credits) This is a seminar for second year genetic counseling students that considers professional development and expanding roles for genetics and genetic counselors - including academic, research and industry applications along with specialty and multi-disciplinary clinics. Students will look at the impact of scientific discovery, legislative action, and public opinion on genetic counseling and genetic medicine. Emphasis is placed on legal, social, and ethical issues in genetic service delivery. Discussions will be based on current events and individual cases. In addition, this course helps student make the personal transition to the workforce with a focus on developing CVs and cover letters, job interviewing and negotiating.

This weekly class is supplemented by a peer supervision group consisting of first and second year students. This component supports the development of clinical genetic counseling skills through case presentations and discussions of case management. Discussion of specific student cases (both typical and atypical) between students and faculty is used to support the development of skills in communication, critical thinking, interpersonal counseling, psychosocial assessment, and professional ethics.

[HG659] Clinical Internship: See clinical training.

[HG800] Research: See research section.

ELECTIVES

In addition to the core courses, students take elective courses in other departments and schools within the University. Electives are chosen based on the individual interests of the student and are important in allowing them to work with students and faculty with a broad range of perspectives on genetics in the Medical School, as well as the Schools of Public Health, Nursing, Social Work, and Psychology. A more extensive listing is available from the complete course directory of the respective departments. Some of the departments where our students commonly take electives include:

- Health Behavior and Health Education, School of Public Health
- Health Services Management and Policy, School of Public Health
- Public Health Policy and Administration, School of Public Health
- Department of Psychology
- Department of Sociology
- School of Social Work
- Ross School of Business

Sample of Electives

Chronic Illness: This course utilizes a life span approach to chronic illness. The impact of the chronic illness on the individual and family system is explored as well as the reciprocal relationship involving both individual and family impact on the chronic illness.

Counseling and the Health Decision Process: This course examines counseling in health decisions as an interchange between counselor and client which requires the effective communication of information relevant to the health decision/condition, as well as recognition of each participant's differing backgrounds, perspectives, and motivations.

Developmental Disturbances in Childhood: This course describes many of the behavioral disturbances of childhood, including symptoms, prognosis, treatments, and management.

Ethical Considerations for Health Professionals: This course examines the ethical dimensions of health care in the United States. Important moral dilemmas and ethical issues are identified, and various historical, philosophical, and cultural influences on health care are reviewed. Using a case approach, students apply ethical guidelines to specific health care problems, including access to care, maintaining patient autonomy, and selecting health interventions.

Foundations of Maternal & Infant Health: This course provides an opportunity for developing increased knowledge and understanding of three central maternal and child health areas: 1) the health of infants up to six weeks of age and the health of women in their childbearing years; 2) interventions to meet their health problems at the individual, family, and community levels; and 3) current governmental program concepts in maternal and infant care and family planning.

Genetics in Epidemiology: This course offers an introduction to genetics and the analytical methods relevant to epidemiology. Emphasis is on the use of genetics to help describe disease frequency and distribution to gain insight into biological etiologies.

Health Organizations and Administration: This is an introductory course that considers the problems of achieving results through health service organizations.

Introduction to Biostatistics: This course introduces fundamental statistical concepts related to the practice of public health: descriptive statistics; probability; sampling; statistical distributions; estimation; hypothesis testing; chi-square tests; simple and multiple linear regressions; one-way ANOVA.

Introduction to Medical Sociology: This course considers a number of important issues in the sociological study of health and illness.

Issues in Public Health Genetics This course focuses on ethical, legal, and social issues and analysis arising from the increasing application of genetic technologies to the health of individuals and populations.

Mental Disorders and Deviant Behavior of Children and Youth: This course focuses on dysfunctional behavior in children and youth due to interpersonal difficulties or developmental disabilities, its observation, description, and assessment.

Multiculturalism and Health Education: This course focuses on the meaning of ethnicity and social group membership as factors in one's identity and effectiveness as a public health professional. As a result of taking this course, students will be better equipped as professionals to self-reflexively assess their own attitudes about the "other" and to identify, design, and implement effective strategies for health education in multicultural settings.

Principles of Health Behavior: This course provides an overview of psychosocial factors related to health and illness behavior; process of belief and behavior change in relation to health, including strategies for change at the individual, group, and community level.

Psychosocial Factors in Health Related Behavior: This course reviews the psychological and social determinants of health, illness, and sick role behavior, emphasizing the decisional bases for health related actions.

Public Communication Campaigns in Health: This course provides a review of factors involved in the design of health communication campaigns. Implications of persuasive communication models for changing health behavior; role of mass media and interpersonal influence; social marketing; and formative and summative evaluation of campaigns.

Public Health Policy Issues in Women's Health: This course will explore current public health policy issues in U.S. women's health, providing students with the skills necessary to analyze women's health issues from a policy perspective. Current policy issues will be identified and analyzed for a wide variety of women's health issues.

CLINICAL TRAINING

Clinical training is an integral part of the Michigan curriculum and is structured to provide students with increasing counseling responsibilities in a variety of genetics and multidisciplinary clinics. With over 20 permanent clinical genetics sites, our clinical training covers the entire current scope of practice of genetic and genomic medicine. In 1941 the first genetics clinic in the world was founded at The University of Michigan. Since that time there has been incredible growth in our clinical genetics programs, which include nationally respected genetics clinics in pediatrics, adult medicine, cancer, prenatal, cardiovascular, biochemical, disorders of sex development, and ophthalmic disciplines. Students also learn from genetic counselors working in commercial settings, public health genetics, research positions, advocacy roles, and other emerging arenas.

Clinical training starts in the first semester and continues throughout the entire program. The opportunity to take on clinical responsibilities early in training enables our students to rapidly develop independence and confidence as clinicians and to gain expertise in multiple clinical settings.

One-on-one clinical mentoring is an essential component of our clinical training and is provided in a wide range of settings. Experienced and dedicated genetic counseling clinical supervisors are an important part of our training model and students work closely with highly experienced clinicians. In addition, an individualized clinical training plan is developed for each student. Students regularly meet with program leadership to discuss their progress.

Our small class size affords all of our students with multiple opportunities to work in-depth with patients and families with a wide variety of genetic conditions. As a result, our students are able to develop a rich clinical logbook that demonstrates comprehensive training.

CLINICAL TRAINING BY SEMESTER

The **first semester** introduces students to clinical training with the opportunity to observe cases in a variety of clinical settings. Students observe cases on a rotating weekly schedule under the supervision of genetic counselors or other medical staff. This is an opportunity for students to familiarize themselves with different components of the genetic counseling session, observe different counseling styles, and compare and contrast how different clinical sites operate.

In the **second semester** students rotate through one clinical site and begin to take on case responsibilities. These responsibilities may include case preparation, including review of the medical records and literature, obtaining family, medical and pregnancy histories, providing inheritance counseling, presenting cases to the medical staff, participating in case conferences, and composing counseling letters.

The **third semester** (summer) provides students with extensive clinical training and increasing case responsibilities. Over the summer, students participate in two seven-week full time internships (280 hours each). One of these internships is typically in the state of Michigan and the other is generally located outside of the state of Michigan. Our summer internships provide students with the opportunity to train in varied geographic settings, to work with novel patient populations, and to pursue individual clinical interests.

The **fourth semester** (fall year 2) includes another clinical internship, during which students assume full responsibility for cases.

During the **fifth semester**, students are given a fair amount of flexibility in their final clinical internship. Some students complete a traditional clinical internship with full responsibility for

assigned cases, while others have the option of completing a Designer Rotation that is tailored to a student's interests.

CLINICAL TRAINING SITES

M University of Michigan Fetal Diagnostic and Treatment Center

The Fetal Diagnostic and Treatment Center provides a full range of consultative and diagnostic services, including genetic counseling, prenatal diagnosis (chorionic villus sampling, amniocentesis, umbilical cord sampling), prenatal screening (first trimester screening, second trimester maternal serum screening, ultrasound, carrier testing, etc.) and perinatal consultation and management.

M University of Michigan Pediatric Genetics Clinic

The Pediatric Genetics Clinic provides service in the diagnosis, treatment and prevention of birth defects, structural abnormalities, inherited diseases, chromosomal abnormalities and intellectual disability.

M University of Michigan Genetics Outreach Program

The Division of Pediatric Genetics conducts genetics field clinics in Traverse City, Gaylord, and Marquette, Michigan. Outreach clinics are a unique opportunity to evaluate and manage genetics patients in diverse settings.

M University of Michigan Medical Genetics Clinic

The Medical Genetics Clinic provides counseling for adult patients who either have or are at-risk for a genetic condition. Services provided include diagnosis, care management, genetic counseling and genetic testing.

M University of Michigan Breast and Ovarian Cancer Risk Evaluation Clinic

The Breast and Ovarian Cancer Risk Evaluation Program provides individuals with an accurate assessment of their personal risk for developing breast and other related cancers and offers a plan for follow-up and preventive care.

M University of Michigan Cancer Genetics Clinic

The Cancer Genetics Clinic provides counseling for all types of cancer including: familial colon cancer, breast cancer, ovarian cancer, cancer of the uterus, prostate cancer, melanoma, thyroid cancer, sarcoma, childhood cancers, and other less common tumors.

M University of Michigan Ophthalmic Genetics

The Ophthalmic Genetics Clinic is a specialty clinic which provides services primarily to patients with or at risk for inherited retinal diseases such as Stargardt's disease, Best disease, and retinitis pigmentosa. Part of this rotation also includes experience in the Ophthalmic Molecular Genetics Diagnostics Laboratory.

M University of Michigan Biochemical Genetics

The Biochemical Genetics Clinic is a specialty clinic that provides services primarily to patients with known or suspected metabolic conditions.



University of Michigan Cardiovascular Genetics

The discipline of Cardiovascular Genetics is well represented at the University of Michigan including in the Inherited Cardiomyopathy Clinic, the Inherited Arrhythmia Clinic, the Aorta Program and the Congenital Heart Center and the Pediatric Cardiovascular Genetic Clinic



University of Michigan Disorders of Sexual Development Clinic

The DSD Clinic provides multidisciplinary care related to the diagnosis and treatment of children with a variety of conditions, including congenital adrenal hyperplasia, 5-alpha-reductase deficiency, androgen insensitivity syndrome, etc. The clinic is staffed by providers from pediatric urology, surgery, endocrinology, psychology, social work, and genetics.



University of Michigan Adult Cystic Fibrosis Clinic

The Adult Cystic Fibrosis Clinic at the University of Michigan Cystic Fibrosis Center was created to transition young people living with cystic fibrosis into a medical environment that offers care in young adulthood and beyond. The team includes doctors, nurses and other professionals, including social workers, dieticians and physical therapists, to provide our patients with comprehensive care for CF in their adult years.



University of Michigan Comprehensive Hemoglobinopathy Clinic

The Comprehensive Pediatric Hemoglobinopathy Clinic takes a multidisciplinary approach to managing sickle cell disease and thalassemia. This program is composed of a multidisciplinary team of health professionals with the primary goal of coordinating the delivery of specialized comprehensive health care and resources to children and families affected by sickle cell disease and other hemoglobinopathies. The program serves approximately 160 patients with sickle cell disease in a five-county region of Southeastern Michigan.

LOCAL OFF-CAMPUS CLINICAL TRAINING SITES

Beaumont, Dearborn: General, Cancer, and Reproductive

Beaumont, Royal Oak: Reproductive, Pediatric, and Cancer Genetic

Flower Hospital: Cancer Genetics

Henry Ford Hospital: Reproductive, Medical, and Cancer Genetics

Progenity: Laboratory Genetics

Promedica Hospital: Reproductive Genetics

St. Joseph Mercy Hospital: Cancer Genetics

Spectrum Health: Reproductive, Pediatric, and Cancer Genetics

DESIGNER ROTATIONS

If a student's clinical training and research thesis are in good standing, students have the option of participating in a designer rotation during their final semester. These rotations allow students to work in a wide variety of clinical settings and to interact with clinicians from multiple specialties and patients facing diverse clinical situations. The focus of the rotation is determined by a student's interests and can include non-traditional insights into clinical settings they have already worked in or emerging areas of genetic and genomic medicine. These customized training experiences provide students with novel perspectives on the practice of genetic counseling and roles for genetic counselors.

SAMPLE DESIGNER ROTATIONS

Women's Reproductive Health

Oncology: Patient Experiences

Living with Genetic Disease

Genetic Counseling in a Commercial Laboratory

RESEARCH

During the two-year program, students are responsible for developing an individualized scholarly project in collaboration with a member of the faculty. Working on the research thesis allows students to develop skills that enhance intellectual development and critical thinking. Our research program is driven by the interests of the individual student and takes advantage of the wide variety of genetics & genomics initiatives on the University of Michigan campus and within the state of Michigan. In previous years, students' research has focused on the practice of genetic counseling, the development of genomic-based health care, gene identification, public policy, patient and clinician education about genetics-based health care, and professional development. Students present and publish their results in local, regional, and national forums.

This first-hand experience with the research process allows our students to develop new skills that may include, but are not limited to: generating and testing a hypothesis, working with the Institutional Review Board (IRB) to develop a study involving human subjects, performing bench work in the laboratory, survey design, interviewing, statistical analysis, collaborating with mentors and committee members, writing proposals, developing scientific presentations (both written and oral) and writing manuscripts. This process is supplemented by our two research courses offered during our first year of training (HG642/HG643). The goal is for students to contribute new knowledge to the field of genetics and the practice of genetic counseling. Since each student's research thesis grows out of their own interests, each student's research experience and "lessons learned" are unique.

EXAMPLES OF RECENT PUBLICATIONS FROM STUDENT RESEARCH THESES

Love-Nichols J, Uhlmann WR, Arscott P, Willer C, Hornsby W, Roberts JS. A survey of aortic disease biorepository participants' preferences for return of research genetic results. *Journal of Genetic Counseling* (2020). DOI:10.1002/jgc4.1341

Marzulla T, Roberts JS, DeVries R, Koeller DR, Green RC, Uhlmann WR. Genetic counseling following direct-to consumer genetic testing: Consumer perspectives. *J Genet Couns.* 2020 Jul 9. doi: 10.1002/jgc4.1309.

Miller I, Greenberg S, Yashar BM, Marvin ML. Improving access to cancer genetic services: perspectives of high-risk clients in a community-based setting. *J Community Genet.* 2020;11(1):119-123. doi:10.1007/s12687-019-00420-z

Read P, Yashar BM, Robinson L, Marvin M. Optimizing efficiency and skill utilization: Analysis of genetic counselors' attitudes regarding delegation in a clinical setting. *Journal of Genetic Counseling* (2020). DOI: 10.1002/jgc4.1181

Sheldon JP, Oliver M, Yashar BM. Rewards and challenges of parenting a child with Down syndrome: a qualitative study of fathers' perceptions. *Journal of Disability and Rehabilitation* (2020). DOI: 10.1080/09638288.2020.1745907

Erwin D, Uhlmann W, Freeark K, Yashar BM. Preadoption Genetic Testing: Social workers' decision-making process. *Adoption Quarterly* (2019). DOI: 10.1080/10926755.2018.1488329

Mazzola SE, O'Connor B, Yashar BM. Primary care physicians' understanding and utilization of pediatric exome sequencing results. *J Genet Couns.* 2019;28(6):1130-1138. doi:10.1002/jgc4.1163

Dettwyler SA, Zielinski RE, Yashar BM. Certified Nurse-Midwives' Experiences with Provision of Prenatal Genetic Screening: A Case for Interprofessional Collaboration. *J Perinat Neonatal Nurs.* 2019;33(4):E3-E14. doi:10.1097/JPN.0000000000000440

Greenberg S, Yashar BM, Pearlman M, Duquette D, Milliron K, Marvin M. Evaluating and improving the implementation of a community-based hereditary cancer screening program. *J Community Genet*. 2018 Mar 5. doi: 10.1007/s12687-018-0357-5.

Koeller DR, Uhlmann WR, Carere DA, Green RC, Roberts JS, PGen Study Group. Utilization of Genetic Counseling after Direct-to-Consumer Genetic Testing: Findings from the Impact of Personal Genomics (PGen) Study. *J Genet Couns*. 2017 Dec; 26(6): 1270-1279. doi: 10.1007/s10897-017-0106-7. Epub 2017 May 16.

Weipert CM, Ryan KA, Yashar BM, Chinnaiyan AM, Scott Roberts J, De Vries R, Zikmund-Fisher BJ, Raymond VM. Physician Experiences and Understanding of Genomic Sequencing in Oncology. *J Genet Couns*. 2018 Feb; 27(1): 187-196. doi: 10.1007/s10897-017-0134-3. Epub 2017 Aug 24.

Ko, C., Arscott, P., Concannon, M., Saberi, S., Day, S.M., Yashar, B.M., Helms, A.S. Genetic testing impacts the utility of prospective familial screening in hypertrophic cardiomyopathy through identification of a nonfamilial subgroup. *Genetics in Medicine*. 2017. doi:10.1038/gim.2017.79

Lesperance MM, Winkler E, Melendez TL, Yashar BM. "My Plate is Full": Reasons for Declining a Genetic Evaluation of Hearing Loss. *J Genet Couns*. 2018 Jun;27(3);597-607. doi: 10.1007/s10897-017-0149-9. Epub 2017 Oct 4.

Hale, C.L., Niederriter, A.N., Green, G.E., Martin, D.M. Atypical phenotypes associated with pathogenic CHD7 variants and a proposal for broadening CHARGE syndrome clinical diagnostic criteria. *Am J Med Genet A*. 2016 Feb;170(2):344-54

Higuchi EC, Sheldon JP, Zikmund-Fisher BJ, Yashar BM. Non-invasive prenatal screening for trisomy 21: Consumers' perspectives. *Am J Med Genet A*. 2016 Feb;170(2):375-85.

Kiedrowski LA, Owens KM, Yashar BM, Schuette JL. Parents perspectives on variants of uncertain significance from chromosome microarray analysis. *J Genet Couns*. 2016 Feb;25(1):101-11.

Ernst ME, Sandberg DE, Keegan C, Quint EH, Lossie AC, Yashar BM. The lived experience of MRKH: sharing health information with peers. *J Pediatr Adolesc Gynecol*. 2015 Oct 8. pii: S1083-3188(15)00320-4.

Batte B, Sheldon JP, Arscott P, Huismann DJ, Salberg L, Day SM, et al. Family Communication in a Population at Risk for Hypertrophic Cardiomyopathy. *J Genet Couns*. 2015 Apr;24(2):336-48.

Giordimaina AM, Sheldon JP, Petty EM. Anticipated motivation for genetic testing among smokers, nonsmokers, and former smokers: an exploratory qualitative study of decision making. *Public Health Genomics*. 2014;17(4):228-39.

Hock KT, Christensen KD, Yashar BM, Roberts JS, Gollust SE, Uhlmann WR. Direct-to-consumer genetic testing: an assessment of genetic counselors' knowledge and beliefs. *Genet Med*. 2011;13(4):325-32.

Huismann DJ, Sheldon JP, Yashar BM, Amburgey K, Dowling JJ, Petty EM. Quality of life and autonomy in emerging adults with early-onset neuromuscular disorders. *Journal of genetic counseling*. 2012;21(5):713-25.

Mester JL, Trepanier AM, Harper CE, Rozek LS, Yashar BM, Uhlmann WR. Perceptions of licensure: a survey of Michigan genetic counselors. *Journal of genetic counseling*. 2009;18(4):357-65.

Murray B, Yashar BM, Uhlmann WR, Clauw DJ, Petty EM. Ehlers-Danlos syndrome, hypermobility type: A characterization of the patients' lived experience. *Am J Med Genet A*. 2013;161A(12):2981-8.

Ordonez J, Margarit S, Downs K, Yashar BM. Peering into a Chilean black box: parental storytelling in pediatric genetic counseling. *Journal of genetic counseling*. 2013;22(6):805-16.

Owens KM, Marvin ML, Gelehrter TD, Ruffin MT, Uhlmann WR. Clinical use of the Surgeon General's "My Family Health Portrait" (MFHP) tool: opinions of future health care providers. *Journal of genetic counseling*. 2011;20(5):510-25.

Wain KE, Uhlmann WR, Heidebrink J, Roberts JS. Living at risk: the sibling's perspective of early-onset Alzheimer's disease. *Journal of genetic counseling*. 2009;18(3):239-51.

Walker LV, Miller VJ, Dalton VK. The health-care experiences of families given the prenatal diagnosis of trisomy 18. *J Perinatal*. 2008;28(1):12-9.

SUPPLEMENTAL ACTIVITIES

A variety of educational and clinical opportunities are integral to the University of Michigan Genetic Counseling Program. These include:

Community Engagement. Outreach is a vital component of the teaching mission of the University of Michigan Genetic Counseling Program, Medical School, and Health System. Our faculty and students provide educational programs to students in local schools, patient support groups, healthcare professionals, and lay groups. Faculty and students also contribute their time and energy to local organizations involved in the care and support of individuals with genetic conditions.

Departmental Retreat. In the fall of each year, all faculty and students in the Department of Human Genetics participate in a weekend retreat. This annual event brings together the research and clinical arms of our department and features a variety of events supporting both professional and personal development.

Laboratory Exposure. Students have multiple opportunities to gain first hand exposure to the roles genetic counselors play within clinical genetic testing laboratories, as well as the processing, analysis and reporting of clinical samples. Students learn from experiences at the University of Michigan's Laboratories and/or commercial genetic testing laboratories such as Myriad Genetics, Invitae, and Quest Diagnostics. Finally, several genetic counselors visit our program each year to speak with our students about their experiences working in a laboratory based setting.

Multicultural Book Club and Movie Night. Each semester, the genetic counseling faculty and students read and discuss books as well as watch films that address issues related to health care and cultural diversity.

Professional Meetings. Students have the option to attend local conferences relevant to genetics and genomics sponsored by the National Society of Genetic Counselors, the Michigan Association of Genetic Counselors, or other groups during their first year of training. The annual meetings of the National Society of Genetic Counselors and typically either the American Society of Human Genetics or American College of Medical Genetics are options during their second year.

Reproductive Loss Series. This is a monthly series led by an adjunct Clinical Instructor in Psychology and Adjunct Associate Professor of Obstetrics and Gynecology and addresses a number of issues related to reproductive loss.

Teaching Opportunities. Students are afforded a variety of teaching opportunities. These include the active participation of second year students in the mentorship and teaching of first year students and community-based outreach activities with local school systems, advocacy groups, and undergraduate programs.

As members of an international research and medical community, a variety of **lectures, conferences, and seminars** by faculty and visiting lecturers occur on a regular basis in the medical center, Department of Human Genetics and affiliated departments. Selected details are available on the Department of Human Genetics website:

<https://medicine.umich.edu/dept/human-genetics>.

COMMITMENT TO DIVERSITY

The University of Michigan Genetic Counseling Program acknowledges the existence of systemic racism and is committed to developing and enacting a thoughtful plan to foster diversity, equity, inclusion and justice within our community and profession. In making this commitment, we recognize the importance of being reflective about the history of our program and profession as we continue to look forward and try to bring about change. We recognize that we are still a work in progress. Our efforts are multifaceted and have focused on some of the following areas.

OUR STUDENTS: We value the diversity of our students as an essential dimension of excellence in education. We learn by listening to voices that may be different from our own. Through the process of holistic review of applicants, funding to support individuals from under-represented minorities, and a variety of outreach activities, we have begun the important work of building a learning community with unique and diverse perspective. Twenty percent of our current cohort of students identify as being from an under-represented racial or ethnic minority, 20% identify as male, and 32% are Pell grant recipients. Moving forward, faculty, staff, and students are working together to evaluate the culture of our community, strengthen existing efforts, identify gaps and barriers, and build new ventures to achieve our goals of an anti-racist inclusive graduate training culture.

OUR CURRICULUM: Students consider issues related to healthcare disparities, cultural humility, and the interplay between genetics, ancestry, and the social construct of race in multiple venues. These topics are addressed in most of the required genetic counseling specific courses, in workshops led by Michigan Medicine's Office of Health Equity and UM's Office of Diversity, Equity and Inclusion, in book and movie discussions, and increasingly in the core genetics courses taught in the Department of Human Genetics. Our curriculum committee has begun the work of examining the content of each of our courses to identify opportunities for continued improvement. Furthermore, students take electives that allow them to explore these topics in an interdisciplinary learning environment. A sampling of relevant offerings in the School of Public Health includes *Confronting and Addressing Racial/Ethnic Disparities in Healthcare*, *Theoretical Foundations for Understanding Psychosocial Determinants of Health*, and *Climate, Justice, Health & Sustainability*.

SCHOLARSHIP: Many of our faculty and students are engaged in scholarly activities that relate to disparities in healthcare and equity in the provision of genetic services. For example, members of the class of 2021 explored important topics related to communication about cancer in the Arab American population, the provision of gender-affirming care of transgender and gender non-binary individuals, and the understanding of variants of uncertain significance across diverse patient populations. We are excited to continue research in this area with current and future students.

OUR PROFESSION: We recognize our important role and responsibility in working to diversify the profession of genetic counseling. This includes not just fostering diversity within our own student body, but also working to build a robust pipeline of diverse individuals to careers in genetics. We have a long-standing history of outreach efforts to local high schools as well as programs here at the University of Michigan. These programs work to expose students from underrepresented minorities to STEM professions.

DUAL DEGREE PROGRAM

Master of Science (M.S.) in Genetic Counseling and Master of Public Health (M.P.H.)

Purpose: The MS-MPH Dual Degree program provides students with an innovative learning experience that includes academic training, research skill development, and clinical instruction focused on helping students address issues that occur at the intersection of the fields of Genetic Counseling and Public Health. Given that the genetic basis of common disease has expanded the reach of genetics & genomics to include the entire population, there are great opportunities and complex challenges for the fields of genetic counseling, medical genetics and genomics, and public health. Graduates of the MS-MPH Dual Degree program will have a sophisticated understanding of these issues and will be poised to develop innovative solutions.

The program is available through the [Genetic Counseling Program](#) (GCP), Department of Human Genetics (DHG) in the Medical School and the [Department of Health Behavior and Health Education](#) or [Health Management and Policy](#) in the School of Public Health. The University of Michigan School of Public Health is currently ranked 4th in the country by U.S. News and World Report.

This program unites the following goals:

- Help individuals and families understand and adapt to the medical, psychological, and familial implications of genetic and genomic contributions to disease.
- Improve health and limit the impacts of disease for populations and individuals.
- Ensure health equity for all people.
- Understand the genetic/genomic basis of common complex diseases.
- Understand the impact of genetics and genomics on health.
- Guide the evolving practice of genetic medicine and public health genomics.

Career Opportunities: The MS-MPH Dual Degree is a novel interdisciplinary training program unique to the University of Michigan. It is anticipated that graduates of this program will become “cross-trained” leaders in their professions who are able to work as both clinicians and public health professionals in academic, community, and industry settings.

Curriculum: A 3-year course of study provides students with academic, research, and clinical training. The program includes academic coursework, a thesis, and practical experiences in both genetic counseling and public health. Students have flexibility in the sequencing of their program, which is designed in consultation with the program directors. Typically, dual degree trainees spend the 1st year working in the genetic counseling program, the 2nd year in public health and in the 3rd year training in genetic counseling and public health is combined. The number of credit hours required to complete both degrees is less than the combined totals for both individual degrees due to content overlap between the two programs and the fact that electives are a required component of genetic counseling training. Dual degree students develop a strong sense of community in both schools.

The curriculum fulfills degree requirements, as mandated by the accrediting bodies, for genetic counseling (Accreditation Council of Genetic Counseling) and public health (Council on Education for Public Health).

Applying to the Dual Degree Program: Prospective students interested in the MS GC-MPH Dual Degree program will be required to meet each School’s entry requirements and standards of admission. Prospective students must apply separately to both the HBHE and GC programs, and be accepted into both in order to enroll in the MS-MPH Dual Degree program. Acceptance in one program does not guarantee acceptance in the other.

Timeline for application (with admission for the Fall term):

- Admission to the GCP is available through [Rackham Graduate School](#), with a deadline of January 5, 2022.
- Admission to the [MPH](#) is available through SOPHAS. Check the [School of Public Health website](#) for additional details.

Financial Plan: At present, many students in HBHE-SPH receive financial support in the form of quarter, half and full scholarships, and students in the GCP-DHG receive limited financial support (including health care/dental coverage for all students and selected tuition stipends). These forms of support will also be available to MS-MPH students.

Additional Information: Those wishing additional information on the MS-MPH Dual Degree program should contact the programs' Co-Directors: Beverly Yashar, MS, PhD (Clinical Professor in Human Genetics) at yashar@umich.edu and/or Scott Roberts, PhD (Professor in Health Behavior & Health Education) at jscottr@umich.edu.

The Michigan campus is home to a wide variety of other academic programs that are relevant to the practice of genetic counseling and genomic medicine. Interested students can develop a student-initiated dual degree program that would allow them to pursue a novel interdisciplinary program, resulting in an MS in Genetic Counseling and a second graduate degree in the student's field of interest. Please speak directly with the Program Director if this option is of interest to you.

Applying to the UM Genetic Counseling Program

The application deadline for admission in the fall semester of 2022 is January 5, 2022.

PROGRAM PREREQUISITES

1) Undergraduate degree:

B.S. or B.A. Most students major in the biological sciences, but this is not required.

2) Classes required (as documented through transcripts):

- science courses up through and including biochemistry. We do not require a laboratory component.
- at least one upper level human genetics course (300 or 400 level if this is available at your institution)
- a general statistics course

3) Advocacy Experience:

Advocacy experience helps candidates develop skills and comfort in taking on some of the responsibilities of a counseling or supportive role. This may be accomplished through a volunteer or paid position with a community-based agency such as a crisis intervention program, Planned Parenthood affiliate, domestic violence program, hospice program, etc., through a position as a resident assistant or student advisor; or through some related activity.

The advocacy experience should provide sufficient opportunity to work in a responsible, one-on-one (in person, by telephone, or text/web-based) relationship with a variety of individuals seeking information, resources, guidance, counseling, or other support services made available through the sponsoring agency or organization. Advocacy experience typically includes training in interpersonal and related skills, ongoing supervision, and opportunities for feedback and continued growth. Most applicants complete this experience on a part-time basis in the evenings and weekends while attending school or working full-time.

4) Registration for the National Match System:

The Association of Genetic Counseling Program Directors (AGCPD) has adopted the Genetic Counseling Admissions Match (the Match). The purpose of the Match is to provide a fair and efficient mechanism to place applicants into positions in masters-level genetic counseling programs. The administration of the Match is carried out by National Matching Services Inc. (NMS), on behalf of AGCPD. Applicants must register online to participate in the Match. Only registered applicants can have their applications reviewed by participating programs. It is recommended that you register for the Match by December 15, 2021. (<https://www.natmatch.com/gcadmissions/>). AGCPD anticipates offering a limited number of Admissions Match Fee Waivers for the 2022 admissions cycle. Further details will be available in mid to late August on the NMS website.

5) Test of English Proficiency (International Students only)

- **English Proficiency Test (for International Students):** See minimum scores for accepted tests, including exemption criteria, at:
<http://www.rackham.umich.edu/admissions/tests>

Of particular note for the 2022 admissions cycle:

- 1) We will not be requiring or reviewing GRE scores for admissions for the fall of 2022.
- 2) We continue to require three letters of recommendation, but no longer require that one must be from your advocacy work.
- 3) We will accept P/F grades due to the COVID-19 pandemic.
- 4) Our interviews will be held remotely rather than in person in Ann Arbor.

ADDITIONAL REQUIREMENTS FOR ADMITTED STUDENTS

1) Technical Standards for Admissions to the Genetic Counseling Program:

The objective of the Genetic Counseling Program at the University of Michigan is to prepare students for entry into the practice of genetic counseling. As defined by the program's accrediting body, the Accreditation Council for Genetic Counseling, an entry-level genetic counselor must demonstrate mastery of a broad body of genetics knowledge and develop skills in the following domains: Communication Skills; Critical-Thinking Skills; Interpersonal, Counseling, and Psychosocial Assessment Skills; and Professional Ethics and Values. Graduate training is a rigorous and intense training process that places specific requirements and demands on enrolled students.

The technical standards set forth below establish criteria that go beyond academic requirements for admission and define essential abilities candidates admitted to the program must possess in order to complete graduate training.

Candidates for selection to the Genetic Counseling Program must meet the following requirements:

- A candidate must be able to communicate effectively and sensitively with patients and all members of the health care team.
- The candidate must have the mental capacity to assimilate, analyze, synthesize, and integrate concepts and to problem solve in a timely fashion.
- The candidate must possess the emotional health and psychological stability required for full utilization of his/her intellectual abilities, the exercise of good judgment, the prompt completion of all responsibilities, and the development of mature, sensitive, and effective relationships with patients and other members of the health care team. The candidate must be able to adapt to changing environments and to function effectively under stress.

Candidates for selection to the Genetic Counseling Program will be required to verify that they understand and can meet these technical standards.

If a student thinks he/she needs an accommodation due to a disability to meet the technical standards, the Office of Services for Students with Disabilities (734.763.3000; <http://www.umich.edu/~sswd/>), can help confirm that the stated condition qualifies as a disability under applicable laws and can make recommendations about accommodations.

2) Background Check

The University of Michigan requires that genetic counseling students undergo a background check through University Human Resources. These background checks occur after offers of admission are accepted, but before students begin their clinical training. For more information about this policy, visit: <http://spg.umich.edu/policy/601.34>.

ADMISSIONS PROCESS

The application and fees for admission for the fall of 2022 are due by January 5, 2022. We believe that it is very important for applicants to have the opportunity to meet with faculty and students, gather first-hand knowledge about our Genetic Counseling Program. Thus, we invite qualified applicants for daylong virtual visits that are generally scheduled in February, March, and April. The visit includes individual interviews with Program Leadership, Department of Human Genetics faculty, supervising genetic counselors, and current students.

Offers to interview are based upon a holistic review of multiple sources of information pertaining to an applicant's experiences, knowledge, skills, and ability. This includes consideration of responses to essay questions, advocacy experience, undergraduate cumulative grade point, course work in science (including biochemistry, human genetics, and statistics) and non-science classes, letters of recommendation, and work experience. We are interested in applicants with a balanced profile; therefore, we do not view any single area of performance in isolation. The use of multiple criteria helps to ensure that there is no disadvantage to applicants for whom English is not a first language or to those who are returning to school. We recognize that applicants typically apply to multiple programs with differing deadlines. The relevant timeline for admissions to the University of Michigan Genetic Counseling Program is as follows:

September 8, 2021	Genetic Counseling Admissions Match Registration Opens for applicants
December 15, 2021	Deadline to Register for the Genetic Counseling Admissions Match through NMS: (https://www.natmatch.com/gcadmissions/)
January 5, 2022	Deadline for submission of UM Genetic Counseling application
February 2022	Invitations for interviews extended
February, March, April 2022	Interviews conducted
April 13, 2022	Rank Order List due to NMS
April 22, 2022	Match Results Release

APPLICATION INSTRUCTIONS

Applicants to the Genetic Counseling Program should submit their application online through the Rackham Graduate School. The application deadline is January 5, 2022. The online application will be available by September 15 at: <http://applyweb.com/apply/umgrad/>.

In addition to submitting the Rackham Graduate School application, you must also register with the National Matching Services by December 15, 2021. Please contact the National Matching Services, Inc. (NMS) directly with any questions. (www.natmatch.com/gcadmissions) and for information about the limited number of Admissions Match Fee Waivers for the 2022 admissions cycle. Details about these waivers will be available in mid to late August.

Rackham Graduate School Application

Please complete the entire application as instructed on the Rackham website. Additional details are provided below. Please contact the Genetic Counseling Program Student Services Coordinator, Heather Dornoff at hdornoff@umich.edu, or (734) 764-8778, if any questions arise regarding the online application.

PAGE 1: GETTING STARTED

Complete as requested.

PAGE 2: PROGRAM SELECTION

Scroll down to Human Genetics and select Genetic Counseling, MS and the appropriate term. Please note, the online application is typically not available before mid-September. Therefore, if you attempt to start an application before September 15, you will be prompted that we are "No Longer Accepting Applications." Please return to the online application in mid-September to start your application.

PAGE 3: PROGRAM SELECTION CONT'D.: FEE WAIVER

If you are applying for the Dual Degree Program with Genetic Counseling and Public Health, please answer “yes” to the question regarding applying to a dual degree with a non-Rackham program, and choose Public Health from the drop down menu. You will ALSO need to submit a separate application to the school of public health (<http://www.sph.umich.edu/>).

Complete remainder of page as requested.

PAGE 4: PERSONAL INFORMATION

Complete as requested

PAGE 5: EDUCATION INFORMATION

Complete as requested.

Regarding transcripts:

1. Upload a copy of your OFFICIAL transcript into the application. For any degree-granting institution, you MUST submit an OFFICIAL transcript. Unofficial transcripts and advising reports will not be accepted, and your application will be considered incomplete.
2. You do not need to submit a transcript to Rackham at the time of application. If you are offered admission, you will submit your final transcript to Rackham at that time.

GRE scores: For the 2022 admissions cycle, GRE scores are not required **and will not be reviewed** as part of an application if provided.

PAGE 6: LANGUAGE PROFICIENCY; AWARDS AND ACTIVITIES

Complete as requested.

English Proficiency Test (for International Students): See minimum scores for accepted tests, including exemption criteria, at: <http://www.rackham.umich.edu/admissions/tests>

PAGE 7: LETTERS OF RECOMMENDATION

Complete as requested.

We require three recommendation letters. Your letters may be from anyone who can comment on your academic, employment, or advocacy experience.

We require all recommendations be submitted electronically. After you have registered the individuals writing your letters, they will receive an email notification with a link that will tell them where to submit a recommendation. When they enter the electronic recommendation system they have the option of completing a standardized form and also uploading a personalized letter. The individuals submitting your recommendations should be **strongly encouraged** to submit personalized letters on your behalf. It is really important that a letter is sent in addition to the score sheet.

If you need to change a recommender or letter after you have registered someone, please contact the Genetic Counseling Program Student Service Representative, Heather Dornoff, at hdornoff@umich.edu or (734) 764-8778.

PAGE 8: EMPLOYMENT HISTORY; RESUME AND FINANCIAL ASSISTANCE

Complete as requested, including uploading a copy of your curriculum vitae or resume. Your curriculum vitae or resume should include information about your exposure to the genetic counseling profession. This can include shadowing experiences, informational interviews attendance at open houses, educational events, etc. In addition, please indicate the date that you registered for the Genetic Counseling Admissions Match and include your Match ID number in your curriculum vitae or resume.

PAGE 9: PROGRAM-SPECIFIC INFORMATION

Additional Education Information: Complete as requested. Please upload copies of **UN**official transcripts from any community or junior college, non-degree study or study abroad coursework. Official transcripts from these additional institutions do **NOT** need to be sent to Rackham.

Academic Statement of Purpose: Write responses to the following four questions. Your answers should be uploaded as a PDF into the online application, as directed. Your response to each question should be limited to 500 words. (REQUIRED)

1. Comment on a personal characteristic that will contribute to your success as a genetic counselor and describe a situation from the recent past that exemplifies this characteristic.
2. What aspects of training and/or working as a genetic counselor do you think present potential challenges for individuals entering this field?
3. Describe your advocacy experience, including the training process for this experience, the number of hours you worked per week, the impact it had on you as a person, and your choice to pursue a degree in genetic counseling.

PAGE 10: ADDITIONAL ESSAY AND INFORMATION

Personal Statement: In writing your personal statement, please specifically address how your background and personal experiences motivated your decision to pursue a graduate degree in genetic counseling. Your personal statement should be limited to 500 words and non-redundant with the material in your other essays, i.e., Academic Statement of Purpose. Your personal statement should be uploaded as a PDF, as directed on the application web site.

Admissions Conduct Code: Complete as requested.

Additional Information: In addition, if you've had an interesting, challenging, or significant personal experience that is not brought out in your application, please describe this experience in the Additional Information box on page 10. You may use this space to include any additional information about your application that you believe the Admissions Committee should know. The admissions committee will spend a great deal of time and care reviewing each application; it is worth your time to let them know who you are, what you've done, and what you hope to do.

PAGE 11: AGREEMENT AND CONFIRMATION

Complete as requested.

APPLICATION CHECKLIST

- Complete registration for the [Genetic Counseling Admissions Match system](#) by **December 15, 2021**.

- Complete online Rackham Graduate School Application, including:
 - Application Form, pages 1 through 11
 - Upload OFFICIAL copies of transcripts from degree granting institution(s) electronically (page 5 of application)
 - Register three individuals to submit letters of recommendation (page 7 of application).
 - Upload Curriculum Vitae or Resume, including your NMS registration date and number (page 8 of application)
 - Academic Statement of Purpose (3 essay questions on page 9 of application)
 - Personal Statement (page 10 of application)
 - Submit application fees to Rackham Graduate School

- Submit English Proficiency Test scores (for International Students): See minimum scores for accepted tests at: <http://www.rackham.umich.edu/admissions/tests>

ALL MATERIALS MUST BE SUBMITTED BY JANUARY 5, 2022.

FREQUENTLY ASKED ADMISSIONS QUESTIONS

Where can I learn more about the Genetic Counseling Admissions Match system?

Please visit the following website for more information on the Match process: [Genetic Counseling Admissions Match system](#)

How will my application be evaluated? We employ a holistic review process in which we give careful consideration to multiple facets of applications such that no single factor leads to either accepting or excluding an applicant from admission. Through this process, we recognize that an applicant's strength in one area might offset a weakness in another. A holistic review also fosters diversity in our student body, with students joining us with unique experiences and perspectives.

What is the University of Michigan looking for in a successful candidate? We might be looking for you! We are looking for applicants who are informed and passionate about the profession of genetic counseling, are academically prepared, have had an appropriate advocacy experience, and who can share some of themselves and their life experiences in responding to the essay questions. An applicant who is exceptionally strong in one area is not at any advantage, and a non-traditional academic experience is not a disadvantage. Returning and foreign students are welcomed. We do not require a minimum GPA. However, in the past successful applicants have generally had a GPA of 3.0 or higher. If you have questions about our admissions standards, please contact us.

What if there are special circumstances to consider? If you've performed poorly in a particular academic area, tell us about it. If you've had an interesting, challenging, or significant personal experience that is not brought out in your application, please include this information in the additional information section of the Rackham application. Please contact us if you would like to discuss your particular circumstance.

Whom should I ask to write letters of recommendation? Your letters of recommendation should provide input from people in responsible positions who can comment on your academic, employment, or volunteer performance, character, and interests. For undergraduates this often means professors, academic advisors, employers, or supervisors from advocacy work. Letters from people who really know you, rather than from people who have impressive titles, are the most valuable. If you have been out of school for several years, it may be more appropriate for your letters to come from individuals who know you now, rather than from college professors who will be less acquainted with your work and activities since graduation. As you decide who you want to ask to write a letter, think about your application in total and ask individuals who can really add depth to the story your application tells about you. If you are reapplying, you should consider asking for updated letters that include commentary on any additional growth, activities, or experiences.

What sort of advocacy experience is Michigan looking for? This experience can cover a broad range of undertakings, since different communities provide access to different advocacy opportunities. Overall, the experience should provide you with 1) training in interviewing, crisis intervention, or other interpersonal communication skills; 2) an opportunity to work one-on-one, in person, by phone, or electronically (text) with clients from a variety of backgrounds; and 3) supervision in some form. The advocacy experience should give you an opportunity to gauge your level of comfort and interest in pursuing a career working with individuals facing issues that do not have a 'right' or 'wrong' outcome but are measured by the client's sense that they have made their own choice and/or are feeling supported through a difficult situation. Community programs that can typically provide this type of experience include, but are not limited to: crisis intervention, unplanned pregnancy, domestic violence, teen runaway, hospice programs, and various support

groups. Programs with the appropriate level of responsibility will require that volunteers are supervised and undergo a training program before taking on responsibility.

What should be included in my responses to the essay questions? Simply put, we want to hear more about you. The application itself provides a guide to your academic and employment timeline. The essays are an opportunity for you to tell us about your experiences and your thinking. This is your chance to let the admissions committee really learn more about who you are. It is a good idea to have someone with professional experience, of any type, read and critique your essay responses before you submit your application. If you are reapplying, you should include commentary on any additional growth, activities, or experiences.

Does Michigan have rolling admissions or offer delayed admissions? No. All applications received by January 5th are given equal consideration and are considered only for enrollment in the following fall.

Is the residency of an applicant considered in the admissions process? No. We make no distinction in our admissions process between in-state, out-of-state, or international applicants.

How many students apply? How many are accepted? In 2021, we received approximately 300 applications. The admission committee selects applicants for interviews and up to ten will then be accepted into the program.

Should I submit GRE scores?

No. For admissions in 2022, GRE scores are not required and will not be reviewed.

Can I visit the Genetic Counseling Program? Physically visiting the Genetic Counseling Program during 2021 and 2022 will be dependent on COVID19 restrictions. If you are interested in visiting, please contact us at UMGenetics@umich.edu for the most recent information. The Genetic Counseling Program is on the Medical Campus. Central Campus is only a few blocks away and is the site of undergraduate classes as well as many student services. Walking tours of the Central Campus may be available through the University. Call the Huetwell Visitors Center at (734) 647-5692 for information or visit the [Undergraduate Admissions](#) website.

How are my transcripts evaluated? Transcripts will be examined for confirmation that the prerequisite courses have been successfully completed. Specifically, this will include: 1) an upper-level human genetics course (generally this means a 300-400 level course, even though the title may include the word 'introduction'); 2) biochemistry (one semester is sufficient and each university will have different science prerequisites for enrollment in biochemistry); and 3) a general, introductory statistics course. In addition, we will be interested in the courses taken within your major and electives taken in other areas. If you are presently enrolled in a course that would qualify as a prerequisite and won't therefore appear on your official transcript, be sure that this is brought to our attention. In short, we look at all years and all courses during your undergraduate experience.

When, where and how are interviews held? Interviews are held in February, March and April. In 2022, all interviews will be virtual. Interviews are an opportunity for applicants to meet both faculty and students and to learn more about the program, the University, and Ann Arbor community.

Are there additional experiences that could strengthen my application? Many of our successful applicants have taken the time to meet with practicing genetic counselors. This experience allows them to gather first-hand knowledge about the profession. If you live in a community that has genetic counselors, we encourage you to meet with them to talk about their professional experiences and, **if possible**, to job shadow. If this is not possible, then you might arrange to talk with a counselor via e-mail or over the phone or virtually. The information gathered

can give you very helpful insights. You can find genetic counselors willing to talk with prospective students by going to the web site for the National Society of Genetic Counselors (www.nsgc.org) and clicking on "Find a Genetic Counselor." If you have experience with the genetic counseling profession, please make sure to highlight this in your application. This includes detailing the specific experiences in your resume and reflecting on these experiences in your essay. If you do not have this experience, we encourage you to work to gain as much knowledge as you can about genetic counseling so that you have a good basis when responding to the essay questions.

PROGRAM EXPENSES

Cost of Study

The graduate training program at Michigan is 5 semesters long and includes 4 academic semesters (two in the 1st year and two in the 2nd year) and a clinical semester that occurs during the summer between the 1st and 2nd academic years. There are no tuition or registration fees during the third semester containing the summer clinical internships. Therefore, students pay tuition for only four of the five training semesters. The tuition per semester for 2019-2020, including fees, was approximately \$24,316 for non-residents and \$12,132 for Michigan residents. The tuition is set annually, usually in the summer, by the Regents of the University of Michigan.

A variety of resources are available to help our students support their educational training at Michigan. Resources include:

- The Genetic Counseling Program awards competitive fellowships/scholarships to our applicants. Details about these fellowships are provided during the interview process.
- Educational stipends from the McTague Educational Endowment to support student travel to educational conferences (available to both 1st and 2nd year students)
- The Neel Genetic Counseling Research Fellowship, a competitive fellowship for eligible second year students
- Graduate student instructor (GSI) positions. Genetic counseling students are eligible to apply for GSI positions in a variety of departments. In the past, students have taught undergraduate courses in biology, biochemistry, and biological anthropology. Compensation for GSI positions includes a tuition waiver and monthly stipend during semesters employed as a GSI. For more information, see: <https://www.umich.edu/~hrra/acadhr/grads/postings.html>
- Work-study programs and other employment. Genetic counseling students have been highly successful in securing work study positions. These positions have included working as research assistants for groups studying the genetics of colon cancer, prostate cancer and retinal disease and serving as clinical assistants to MD geneticists. For more information see <https://www.studentemployment.umich.edu>
- Loans – federal, regional, state and local.

More specific fellowships are listed at the Fellowships office of the Rackham Graduate School (<https://www.rackham.umich.edu/prospective-students/funding>) and the Center for Education for Women (<http://www.umich.edu/~cew/>). Applicants should also consider exploring scholarship directories available at their local libraries and campus career services offices.

To be considered for all possible forms of aid for which you may qualify, a Free Application for Federal Student Aid (FAFSA) for must be completed by March 31. **Contact the Financial Aid Office for information about the FAFSA application.**

Prospective applicants should feel free to contact the Program Director, Beverly Yashar (yashar@umich.edu), the Associate Program Director, Monica Marvin (monicam@umich.edu), or the Assistant Program Director, Beth Dugan (renation@umich.edu) if they have specific questions.

Cost of Living

Housing:

University-owned housing: The demand for University housing runs high. The University maintains the Northwood Community Apartments (North Campus), which consist of 1,089 family and [single graduate housing](#) units and Munger Graduate Residences (main campus). For more information, contact the Housing Information Office. (<http://housing.umich.edu/>)

[Off-Campus Housing](#): The cost of apartments and houses varies with the size, location, and level of luxury of the unit. In spring 2019 these were the **average** prices students paid for 12-month leases for housing (apartments, houses, shared rentals, etc.) within walking distance (half a mile) of central campus:

- 1-bedroom apartments, \$1370/month
- 2-bedroom apartments, \$1650/month
- 3-bedroom apartments, \$2250/month

Prices for housing further from the main campus are generally less expensive. In the past, many students have chosen such housing and taken [public and/or University transportation](#) to get onto campus.

Cooperatives (co-ops) are housing units run by the people who live in them. In exchange for four to six hours of work per week, co-op members save a considerable amount of money they might otherwise spend in another living situation. Charges generally include room, board, utilities, entertainment, and laundry. Contact the [Inter-Cooperative Council](#), 662-4414, for more information.

Health Care Coverage

With support from Rackham Graduate School, the Department of Human Genetics provides GradCare [health insurance](#) and [Dental \(Option 1\)](#) for all Genetic Counseling students who do not have coverage.

About Ann Arbor

Ann Arbor, located along the scenic Huron River valley, is a residential town with a permanent population of about 121,000 and a student population that includes approximately 40,000 University of Michigan students. The University of Michigan (U-M) was established at its Ann Arbor location in 1837, where it has enjoyed a long and rich history. The University possesses dozens of libraries, museums, and learning and computing centers. The U-M Medical Center is one of the largest and most progressive health care facilities in the country. The city and the campus are geographically intertwined with pockets of shops, restaurants, and businesses located between the various campuses.

University and community recreational, concert, theater, dance, art, film societies, and seasonal events are plentiful. Lecture series from many University departments are open to the public. The University encompasses many student organizations, athletic and recreational services, performance groups, political/social activism organizations, and special interest groups. Ann Arbor has a history of active political expression, and as soon as an address is established, students may register to vote. The popular U-M spectator sports offer reduced ticket prices to students. The Department of Recreational Sports provides an assortment of activities and intramural sports at five drop-in facilities. Additionally, the city offers a variety of recreational facilities including swimming pools, ice rinks, parks, bike trails, canoe rentals, tennis courts and basketball courts. The Great Lakes provide excellent day-trip excursions, and Chicago and Toronto offer wonderful weekend trips.

You can learn more about Ann Arbor at <http://annarbor.org/>, <http://www.arborweb.com/>, and <https://www.youtube.com/user/um>.

