

# GENETIC COUNSELING (GEN)

## **GEN 535: Human Embryology (3 credits)**

This three-credit online course provides a comprehensive overview of normal human development from conception to birth. Particular attention will be placed on explaining specific mechanisms of abnormal development that lead to fetal wastage, congenital anomalies, and cancer. Students should have previously taken coursework in biology, genetics and cell biology. With permission of the instructor, the course is suitable for upper level undergraduate students majoring in biology or other majors who intend to pursue professional education in genetic counseling, medicine, nursing or other allied health professions.

## **GEN 600: Medical Genetics I (3 credits)**

This foundation genetics course will cover a myriad of topics from the cell to the whole person and population. Molecular and cellular genetics, cytogenetics, the relationships between DNA, RNA protein will be covered as well as current topics in epigenetics and other complex genetic topics. Population-based concepts such as Hardy-Weinberg equilibrium and population genetics will be woven into real-life cases and family stories.

## **GEN 601: Clinical Fieldwork (3 credits)**

Students will participate in simulated/mock cases as well as direct observation of genetic counseling sessions throughout the semester. This is an opportunity for students to familiarize themselves with different components of the genetic counseling session, observe different counseling styles, and compare how different clinical sites operate. Content will include prenatal, cancer, pediatrics and other specialty areas.  
*Lab fee: \$295*

## **GEN 602: Clinical Fieldwork (4 credits)**

The experience consists of 220-240 hours of fieldwork training under direct supervision in a specific area (or areas) of genetic counseling practice. Students begin to document Participatory Encounters (individual case/patient experiences) in their Logbook. Students should demonstrate a beginning level of proficiency in as many skills as possible within the Practice Based Competencies as defined by the American Board of Genetic Counseling.  
*Lab fee: \$295*

## **GEN 603: Clinical Fieldwork (4 credits)**

The experience consists of 220-240 hours of fieldwork training under direct supervision in a specific area (or areas) of genetic counseling practice. Students are expected to advance the level of skills in areas previously addressed in other rotations and gain new skills with each experience. Students are expected to show professionalism at all times in their fieldwork rotations. Students should demonstrate a moderate-advanced level of proficiency in as any skills as possible within the Practice-Based Competencies as defined by the American Board of Genetic Counseling.  
*Lab fee: \$295*

## **GEN 604: Clinical Fieldwork (3 credits)**

The experience consists of 220-240 hours of fieldwork training under direct supervision in a specific area (or areas) of genetic counseling practice. Students are expected to advance the level of skills in areas previously addressed in other rotations and gain new skills with each experience. Students are expected to show professionalism at all times in their clinical rotations. Students should demonstrate an advanced level of proficiency in as many skills as possible within the Practice Based Competencies as defined by the American Board of Genetic Counseling.  
*Lab fee: \$295*

## **GEN 610: Genomic and Molecular Techniques Lab (3 credits)**

This course focuses on understanding the genomics and molecular techniques that relate to clinical practice. Chromosome banding techniques, karyotyping, fragile sites, known chromosome syndromes, FISH, chromosome microarray, copy number variants, databases for unbalanced chromosome aberrations and genomic variants, single gene sequencing, multi-gene panels, whole exome and genome sequencing will be included. Students will use varied sources of literature and databases to explore approaches to risk assessment. Genetic testing for diagnostic and screening purposes in adults, newborns and other groups will be discussed.

## **GEN 615: Pathophysiology (3 credits)**

This course focuses on concepts of pathophysiology essential to understanding the genetic diseases and disabling conditions that can affect the body systems across the lifespan. Students will learn to explain genetic conditions associated with each system from a physiological standpoint. The signs and symptoms, diagnosis, treatment and inheritance patterns will be reviewed using specific cases.

## **GEN 620: Introduction to Genetic Counseling (3 credits)**

This course will focus on the structure of the genetic counseling session, the skills necessary to practice as a genetic counselor, and issues surrounding the practice of genetic counseling in the 21st century. Through completion of practical activities and assignments, students will demonstrate their abilities to research and prepare for a case, contract with families to determine patient goals, and gather the necessary information from families. They will use role plays to begin to practice their counseling skills. We will also discuss what constitutes appropriate follow-up and documentation. Students will gain familiarity with medical terminology used in clinical genetics and expand their understanding of the impact of genetic disease on families. Additional topics will include disability, cultural competency, insurance, billing and reimbursement, professionalism, genetic discrimination and related legislation.

## **GEN 625: Reproductive Genetics (3 credits)**

This course provides an understanding of reproductive genetics and the skills necessary for clinical practice. Using sample cases, students offer and interpret genetic testing and develop case management skills. Students will be expected to read peer-reviewed journal articles and utilize core genetics databases. All aspects of reproductive genetic counseling are covered, including maternal and carrier screening, teratogen exposures, ultrasound evaluation, prenatal testing, pregnancy loss and termination, assisted reproductive technologies including gamete donation, treatment options using cord blood/tissue and research surrounding regenerative medicine, and perinatal bereavement and hospice services.

## **GEN 630: Clinical Applications in Genetic Counseling (3 credits)**

In this course, we will dive deeply into the molecular and psychosocial issues related to some important and common cardiac, hemoglobinopathy, thrombophilia, bleeding, retinal, and neurologic/neuromuscular disorders. In addition to the didactic component of this course, this course is designed to provide a forum for students to process cases from their summer fieldwork rotations, and present a case in a safe, non-judgmental space.

**GEN 631: Psychosocial Applications in Genetic Counseling I (3 credits)**

This course provides students with a broad understanding of counseling theory and practice. Topics include listening, observation, interview skills and strategies, family dynamics and development, coping and adaptation processes, referral and consultation procedures, and ethical principles. Focus is on first exploring patient characteristics and concerns, then utilizing appropriate counseling skills to respond in a patient-centered way.

**GEN 632: Psychosocial Applications in Genetic Counseling II (3 credits)**

This course utilizes a case-based approach, providing the basis for discussion of a variety of genetic disorders and the application of counseling modalities. Students will have the opportunity to share experiences gained during fieldwork experiences. Discussions emphasize the interplay of medical, psychological, ethical, legal, social, and cultural factors in genetic counseling, including disabilities and palliative care.

**GEN 635: Ethical Issues in Genetic Counseling (3 credits)**

This course is designed to provide students with a practical awareness of ethical standards and codes of conduct in the field of genetic counseling, and will incorporate such topics as ethical decision making, informed consent, confidentiality, allocation of scarce resources, professional competence, multicultural and diversity issues, and implicit bias.

**GEN 640: Cancer Genetic Counseling (3 credits)**

This course will provide students with an introduction to the medicine of hereditary cancers of the breast, ovary and colon, as well as genetic mechanisms of mutations that lead to the conditions. Other hereditary cancer-causing syndromes will be reviewed, such as Li-Fraumeni, multiple endocrine neoplasia and Cowden. Students will become familiar with the terminology and vocabulary associated with oncology, pathology and cancer genetic counseling. Students will learn family and medical history collection, pedigree interpretation and cancer risk model utilization. Testing criteria, presentation of testing options and interpretation of test results will be reviewed, as well as the psychosocial aspects of hereditary cancer counseling.

**GEN 655: Medical Genetics II (3 credits)**

This course will build from basic genetic concepts. Some of the topics addressed include autism spectrum disorders, direct to consumer testing, pain management, complex genetic mechanisms, chronic conditions, pharmacogenomics, and emerging genetics specialties. Students will develop knowledge and genetic counseling skills through lectures, case studies and role-playing.

**GEN 665: Examining Cultural and Social Issues in Genetic Counseling (3 credits)**

The impact of society and cultural norms and traditions is increasingly being recognized as an essential component in the genetic counseling process. This course addresses the social and cultural issues encountered in genetics and genetic counseling, which will be explored through case studies and readings, addressing gender, race, religion, social class, disability, and sexual orientation.

**GEN 670: Advanced Clinical Concepts in Medical Genetics (3 credits)**

This course will be conducted as a case-based review of medical genetics topics, challenging counseling situations, techniques and strategies to facilitate genetic counseling in crisis situations, and helpful ways to enhance communication within families regarding genetic risk. The syndromes discussed in this course are common enough that they are encountered in genetics, developmental, neurologic, psychiatric, oncology and other specialty clinics more often than other conditions, and students are more likely to see them and need to understand them. It is not meant to be an exhaustive list, and it is likely that students will encounter scenarios in fieldwork rotations or on the boards that are not reviewed here.

**GEN 697: Applied Research Methods in Genetic Counseling (3 credits)**

In this course, the students will learn about qualitative and quantitative methods, critical analysis, and scholarly writing techniques so that they can become consumers of available research and be able to conduct graduate-level research projects to improve the field of genetic counseling. The students will choose a partner, and together decide upon a research topic for their capstone project, begin drafting their IRB application(s), find a committee member, and perform an oral defense of their capstone proposal.

**GEN 698: Capstone I (3 credits)**

In this course, students will develop their genetic counseling capstone projects. They will seek IRB approval from any sites where they will be collecting data and from Bay Path University IRB. The students will also identify their advisory committee and will present their research proposal at the end of the semester. Upon completion of these tasks, the students begin data collection.

**GEN 699: Capstone II (3 credits)**

In this course, students will work in conjunction with their research advisory committees to continue to collect quantitative and/or qualitative data. They will begin and complete data analysis via quantitative and qualitative software programs. They will submit their written capstone final papers and participate in an oral defense of their research. The students will also participate in other research activities such as Bay Path University's Academic Achievement day.