GENOMICS (GNM)

GNM 701 Introduction to Genomics (3 credits)
This course explores the history of genetics and genomics. Family history is discussed as a vital part of a genetic riskassessment and tool for the evaluation of inheritance patterns and penetrance of the disease. The course concludes with areview of the epigenetic influences on health and epidemiologic approaches to evaluate health and disease and applicationsin genomics.
Restrictions: Enrollment is limited to Graduate level students.

GNM 702 Genetic Concepts Testing (3 credits)
The course will serve as the basis for the health care professional to integrate genetics and genomics into personalized healthcare. The course provides a review of sources of information available to you and clinicians in genomic health care forclinical management and therapeutic applications.
Restrictions: Enrollment is limited to Graduate level students.

GNM 703 Issues in Genomics & Pharma (3 credits)
This course exposes students to the ethical, legal, and social issues surrounding genetic testing and available direct-to-consumer genetic testing. This course will explore approaches for engaging individuals as partners in their healthcare, aswell as the expanding applications of pharmacogenomics.
Restrictions: Enrollment is limited to Graduate level students.

GNM 704 Cancer Genomics & Applications (3 credits)
This course focuses on the role of genetics and genomics in cancer diagnosis, prognosis, and treatment. Future directions ofgenetics and genomics with comprehensive genome/exome/transcriptome sequencing in oncology, polygenic risk scores,cell-free DNA, and genome-wide and phenome-wide association studies are addressed. Genomic technologies andcomputational approaches that are driving advances to manage health and treat disease will be reviewed.
Restrictions: Enrollment is limited to Graduate level students.

GNM 710 Principles of Genetics (3 credits)
This course provides you with an introduction to genetics, with a focus on transmission and molecular genetics. The coursemakes use of bioinformatics to explore gene function and covers pertinent applications of bioinformatics and genetics tomodern biological problems. Topics include chromosome structure and replication, variations and extensions oftransmission genetics, genetic linkage and mapping, regulation of gene expression, epigenetics, genetic mutations, geneticsof cancer, and the principles of genetic engineering.
Restrictions: Enrollment is limited to Graduate level students.

GNM 715 Chromosomes & Human Disease (3 credits)
This course introduces you to the role of chromosomes in human disease and seeks to familiarize you with the field ofcytogenetics, the study of chromosomes, and the relationship between chromosomal abnormalities and human disease.Topics covered include cytogenetic methodology, aneuploidy, chromosome rearrangements, chromosomes and sexdetermination, and chromosomes and cancer.
Restrictions: Enrollment is limited to Graduate level students.

GNM 720 Molec Basis Inherited Disease (3 credits)
This course seeks to familiarize you with the molecular basis of diseases of human genetics and its applications to modernresearch. You will undertake a comprehensive examination of the principles of human inheritance in the context of bothnormal human variation and human disease. The course explores mechanisms of gene regulation and introduces you tocurrent methods in genome analysis.
Restrictions: Enrollment is limited to Graduate level students.

GNM 725 Clinical App Genetics&Genomics (3 credits)
The course focuses on the genetic basis of disease and cytogenic analysis for applications to clinical care. Diagnosticmolecular approaches and the clinical translation of genetic and genomic health information in a personalized healthcare environment are explored.
Restrictions: Enrollment is limited to Graduate level students.

GNM 730 Evolutionary Analysis (3 credits)
This course introduces you to evolutionary science and population genetics, with a focus on the importance of four factors:selection, migration, mutation, and genetic drift. You will evaluate human evolution and its impact on health.
Restrictions: Enrollment is limited to Graduate level students.

GNM 735 Human Population Genetics (3 credits)
The sequencing of the human genome has led to the emergence of population genomics. This course covers the basics ofpopulation genomic analysis, from SNP data to the key analyses that may be required to successfully analyze a populationgenetic data set. Population genetics topics will also include computational methods and machine learning techniques.
Restrictions: Enrollment is limited to Graduate level students.

GNM 740 Public Health Genetics (3 credits)
Public health ensures the basic conditions required for individual and population health are present. The role of genetics isevolving, as is the understanding of genetic disease. This course provides students with advances in genetic knowledge andtechnology that could be used to prevent disease and improve public health.
Restrictions: Enrollment is limited to Graduate level students.

GNM 745 Genomic Statistics & Research (3 credits)
This course provides you with an introduction to the statistical approaches used in solving problems in geneticepidemiology. Methodological expositions and practical guidelines for software selection are included. Topics includemolecular genetics and Mendelian description principles, genetic markers and map distances, model-based and model-freepopulation and family-based and genome-wide association studies, and association analyses using haplotypes.
Restrictions: Enrollment is limited to Graduate level students.