

# GSPH Course Descriptions

December 11, 2017

**FTDR 3999 FULL-TIME DISSERTATION RESEARCH Credit(s): 00.0**

DOCTORAL CANDIDATES WHO HAVE COMPLETED ALL CREDIT REQUIREMENTS FOR THE DEGREE, INCLUDING ANY MINIMUM DISSERTATION REQUIREMENTS, AND ARE WORKING FULL-TIME ON THEIR DISSERTATIONS MAY REGISTER FOR THIS COURSE. WHILE THE COURSE CARRIES NO CREDITS AND NO GRADE, STUDENTS WHO ENROLL IN "FULL-TIME DISSERTATION STUDY" ARE CONSIDERED BY THE UNIVERSITY TO HAVE FULL-TIME REGISTRATION STATUS.

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**HUGEN 2010 BIOINF RESOURCES GENETICISTS Credit(s): 01.0**

**Corequisite(s): HUGEN 2022 and HUGEN 2040**

The focus of this course is the online bioinformatic resources available to geneticists. Students will learn to locate and use such resources and interpret the data therein to inform the development of research questions, aid in clinical decision-making, and enhance the understanding and contextualization of research results.

[New course for fall 2016, term 2171. For HUGEN students.]

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**HUGEN 2011 SCIENTIFIC WRITING HUMN GENETC Credit(s): 01.0**

Writing and communication skills are amongst the most important assets for any human genetics researcher and/or public health genetics professional. By facilitated discussions and reading and writing exercises/assignments, Scientific Writing in Human Genetics is designed to empower Human Genetics students to establish the communication mindset to write clear and compelling scientific narratives in plain language, utilize the writing resources available on campus and online, improve their scientific writing skills, and complete a solid draft of the Background/Introduction section of their MPH essay, MS Thesis, or PhD research proposal/comprehensive exam document (and possibly, additional sections, including methods, results, or the entire MPH essay) or another academic work with permission of the instructor. The ability to write and use standard English language is required. Whether English is your first or second language, if you are not comfortable writing grammatically correct and properly punctuated English, an "ESL course" is recommended.

[New course, fall 2017, term 2181.]

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**HUGEN 2021 SPECIAL STUDIES Credit(s): 0.1 TO 15.0**

QUALIFIED STUDENTS MAY UNDERTAKE ADVANCED WORK OR RESEARCH WITH THE APPROVAL AND UNDER THE GUIDANCE OF A MEMBER OF THE STAFF.

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**HUGEN 2022 HUMAN POPULATION GENETICS Credit(s): 02.0**

This survey course covers the principles of population genetics as applicable to human populations, including (1) the laws of inheritance that govern the organization of the genomes in populations, (2) the evolutionary forces and phenomena that impact genetic diversity in human populations, and (3) the foundational concepts of genetic epidemiology and gene discovery.

[Effective fall 2017, term 2181, revised course description.]

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**HUGEN 2025 HUMAN GENETICS SEMINAR Credit(s): 00.0**

HUMAN GENETICS SEMINARS PRESENT CURRENT GENETICS METHODOLOGY, THEORY, AND DATA.

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**HUGEN 2026 SPECIAL STUDIES HUMAN GENETICS Credit(s): 03.0**

This course is designed to provide advanced undergraduates and graduate students with directed, intensive training in laboratory, statistical or clinical research methods relevant to human genetics. These specialized skills are not available in regularly taught courses in the university. Each special study is designed in consultation with an individual member of the human genetics faculty.

[Effective fall 2017, term 2181, revised course description.]

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**HUGEN 2027 HUMAN GENTCS FALL JOURNAL CLUB Credit(s): 01.0**

HUMAN GENETICS JOURNAL CLUB MEETS ONCE A WEEK DURING THE FALL SEMESTER TO GIVE STUDENTS AND FACULTY A CHANCE TO PRESENT EXCITING RESEARCH WHICH THEY FEEL IS RELEVANT TO THE DEPARTMENT. THE AUDIENCE IS OTHER STUDENTS AND FACULTY FROM THE DEPARTMENT AND OTHER DEPARTMENTS OF THE SCHOOLS OF HEALTH SCIENCES. PRESENTATIONS ARE INFORMAL AND MEANT TO GIVE STUDENTS THE EXPERIENCE NECESSARY TO BE AN EFFECTIVE COMMUNICATOR, AND TO TEACH THEM CRITICAL SKILLS FOR EVALUATING RESEARCH PUBLICATIONS.

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**HUGEN 2028 HUGEN JOURN CLUB & PEER REVW Credit(s): 01.0**

Human genetics journal club provides students and faculty with an opportunity to present and discuss exciting research in an informal format. The purpose of the course is to hone students' oral and written critical evaluation skills.

[Effective spring 2018, term 2814, revised course description.]

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**HUGEN 2029 INTRODUCTION TO GENE MAPPING Credit(s): 03.0**

**Prerequisite(s): HUGEN 2022 and HUGEN 2040 and HUGEN 2034 BIOST 2041**

This course presents a literature-based approach to understanding and interpreting results from gene mapping papers in the field of human genetics. Traditional and state-of-the-art genetic mapping methodologies will be explored.

Students should have a basic understanding of biostatistics [BIOST 2041], molecular genetics [HUGEN 2034 or 2040], and population genetics [HUGEN 2022].

[Effective 2017, term 2181, revised course description.]

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**HUGEN 2031 CHROMOSOMES AND HUMAN DISEASE Credit(s): 03.0**

THE ROLE OF CHROMOSOMES IN HUMAN DISEASE IS DISCUSSED AFTER A THOROUGH BACKGROUND ON CHROMOSOME STRUCTURE AND FUNCTION IS PRESENTED. TOPICS COVERED INCLUDE CYTOGENETIC METHODOLOGY, ANEUPLOIDY, CHROMOSOME REARRANGEMENTS, CHROMOSOMES AND CANCER, CHROMOSOME BREAKAGE SYNDROMES, AND FRAGILE SITES ON HUMAN CHROMOSOMES.

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**HUGEN 2032 GENETIC TECHNIQUES Credit(s): 02.0**

**Prerequisite(s): HUGEN 2031**

STUDENTS PARTICIPATE IN LABORATORY EXERCISES TO BECOME ACQUAINTED WITH CYTOGENETICS LABORATORY PROCEDURES INCLUDING CELL CULTURE, CHROMOSOME PREPARATION, CHROMOSOME BANDING, AND KARYOTYPING. CHROMOSOME ANALYSIS AND KARYOTYPE INTERPRETATION ARE PRACTICED.

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**HUGEN 2034 BIOCHEM MOLEC GENET CPLX DS Credit(s): 03.0**

This course provides students with an overview of the molecular and biochemical genetic approaches to determine the underlying genetic architecture of common diseases that account for a large portion of the public health burden of disease. The genetic, environmental and epigenetic factors that influence susceptibility to common disease will be illustrated using selected examples, such as cardiovascular disease, neurodegenerative diseases, mental health diseases, autoimmune diseases and eye diseases.

[Effective spring 2018, term 2184, revised course description.]

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**HUGEN 2035 PRINCIPLES OF GENETIC COUNSLNG Credit(s): 03.0**

This course addresses fundamental concepts important to genetic counseling principles and practice.

[Effective 2017, term 2181, revised course description.]

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**HUGEN 2036 GENETIC COUNSELING INTERNSHIP Credit(s): 04.0**

For this course, students will participate in supervised genetic counseling clinical rotations in a variety of specialty areas. The lectures that are part of the course will address topics relevant to clinical genetics and counseling.

[For Genetic Counseling students.]

[Effective 2017, term 2181, revised course description.]

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**HUGEN 2038 INTERVNTN SKILL GENETIC CNSLG Credit(s): 03.0**

**Corequisite(s): HUGEN 2035**

FOCUSES ON THE UNDERSTANDING OF THEORIES OF INTERVENTION, SKILL DEVELOPMENT AND APPLICATION TO GENETIC COUNSELING. THE COURSE AIMS AT SENSITIZING STUDENTS TO THE ETHICAL DILEMMAS FACED BY AFFECTED FAMILIES AND HEALTH-CARE PROVIDERS.

(For Genetic Counseling students)

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**HUGEN 2039 RISK CALCULATION GENETIC CNSLG Credit(s): 01.0**

**Corequisite(s): HUGEN 2022**

This course provides hands-on training in calculating risk of disease or carrier status in a variety of typical genetic counseling situations, as well as discussion of the limitations of those calculation methods.

[Effective spring 2018, term 2184, revised course description.]

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**HUGEN 2040 MOL BASIS OF HUMN INHERITED DS Credit(s): 03.0**

This course will provide an overview of selected human inherited disorders and integrate clinical descriptions with recent genetic, molecular genetics and biochemical insights. Current state of the art molecular genetics methodologies will be integrated into the overviews.

[Effective 2017, term 2181, revised course description.]

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**HUGEN 2041 BIOETHICS Credit(s): 03.0**

THIS COURSE IS AN ADVANCED TREATMENT OF SIGNIFICANT PROBLEMS IN MEDICAL ETHICS. TOPICS MAY INCLUDE EUTHANASIA, RIGHTS TO HEALTH CARE, COMPETENCY, ALLOCATION OF RESOURCES, AND OTHER ISSUES OF MEDICAL ETHICS.

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**HUGEN 2047 CLIN GENETICS CASE CONFERENCE Credit(s): 01.0**

WITH CLINICAL CASES AND SPECIMENS FROM VARIOUS CLINICAL GENETICS SERVICE UNITS, THIS SEMINAR ILLUSTRATES AND PROVIDES INSIGHTS INTO THE BIOLOGIC, MEDICAL, ETHICAL, AND EMOTIONAL ASPECTS OF GENETIC DISORDERS.

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**HUGEN 2049 INTRODUCTION PUBLIC HEALTH GENETICS Credit(s):**

This course provides a framework in which to assess how advances in genomics may be applied to public health practice and policies that affect both individuals and society. In addition, the ethical, legal, and social consequences of historical, current, and future interventions are considered.

[Effective 2017, term 2181, revised course description.]

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**HUGEN 2050 PUBLIC HEALTH GENETICS PRACTCM Credit(s): 01.0 to 06.0**

The practicum is a short term field placement (minimum 200 hours of public health oriented work) with an organization or agency that is relevant to the student's area of interest. Each placement must be agreed upon by the student and the MPH program advisor.

[For PH Genetic students and PH Genetic certificate.]

[Effective 2017, term 2181, revised course description.]

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**HUGEN 2051 INBORN ERRORS OF DEVELOPMENT Credit(s): 02.0**

THIS COURSE FOCUSES ON THE CONNECTIONS BETWEEN HUMAN DEVELOPMENT AND INHERITED DISEASE. THE COURSE WILL INCLUDE CORE PRINCIPLES OF DEVELOPMENT OF THE BODY PLAN AND SIGNALING PATHWAYS INVOLVED IN DEVELOPMENT AND DIFFERENTIATION. THESE BIOLOGICAL PROCESSES WILL BE USED TO CATEGORIZE INHERITED HUMAN DISEASES, UNDERSTAND DISEASE MECHANISMS, AND THE CURRENT EFFORTS TO DEVELOP TARGETED TREATMENTS.

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**HUGEN 2052 ETHCL ISS CLN & PUBHL GENTICS Credit(s): 01.0**

**Corequisite(s): HUGEN 2035 or HUGEN 2049**

This course is designed to explore ethical issues as they relate to genetics and genomics in both the clinical and public health contexts. This seminar series provides an ethical framework for analyzing arguments in the literature and cases arising in clinical and research contexts and proceeds throughout the semester with a discussion-based format that encourages students to assume responsibility for engaging in ethical analysis.

[New course for spring 2017, term 2174.]

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**HUGEN 2053 APPLCS IN PH GENTCS & GENOMCS Credit(s): 02.0**

**Corequisite(s): HUGEN 2049**

**Prerequisite(s): BIOST 2041 or BIOST 2011**

This graduate level course builds on the basic components of public health genetics and genomics and provides students with the opportunity to discuss and apply these concepts to public health. The goal of this course is for students to apply knowledge and skills learned across public health disciplines, especially the use of genetic principles, in a public health practice setting. Using current issues in public health genetics, students will also demonstrate mastery of essential competencies through data analysis, and oral and written communication.

[New course, fall 2017, term 2181.]

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**HUGEN 2070 BIOINF FOR HUMAN GENETICS Credit(s): 03.0**

**Prerequisite(s): HUGEN 2022 and BIOST 2041**

THIS COURSE FOCUSES ON MANIPULATION AND MANAGEMENT OF HUMAN GENETIC DATA, WITH AN EMPHASIS ON ASSOCIATION AND LINKAGE STUDIES. THE COURSE WILL COVER BIOINFORMATICS FOR GENOME-WIDE ASSOCIATION ANALYSIS, SEQUENCE DATA, AND INTEGRATED ANALYSES, AS WELL AS THE R STATISTICAL COMPUTING LANGUAGE. A KEY COMPONENT OF THE COURSE WILL BE HANDS-ON ANALYSES OF EXAMPLE DATA SETS.

(Note: Students should also have basic computing and programming skills.)

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**HUGEN 2080 STATISTICAL GENETICS Credit(s): 03.0**

**Prerequisite(s): HUGEN 2022 and BIOST 2041**

AN ADVANCED COURSE WHICH DISCUSSES THE PRINCIPLES AND PRACTICE OF STATISTICAL GENETICS IN THE AREA OF GENETIC EPIDEMIOLOGY OF HUMAN DISEASES AND TRAITS. THE COURSE WILL COVER STATISTICAL MODELING AND METHODOLOGY IN FAMILIAL AGGREGATION, LINKAGE ANALYSIS AND ASSOCIATION ANALYSIS; THE COURSE INCLUDES HANDS-ON EXPERIENCE WITH CURRENT COMPUTER PROGRAMS USED IN THESE RESEARCH AREAS.

Prerequisites:HUGEN 2022, POPULATION GENETICS and BIOST 2041, BIOSTATISTICS METHODS I (and BASIC COMPUTING AND PROGRAMMING SKILLS).

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**HUGEN 3010 RESEARCH & DISSERTATION PH.D. Credit(s): 01.0 to 15.0**

DISSERTATION CREDITS FOR QUALIFIED DOCTORAL STUDENTS IN THE DEPARTMENT OF HUMAN GENETICS.

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