Term: **Fall 2011**
Course Number: **GENET 236**
Course Title: **Genetic Epidemiology and Population Genetics**
Course Director: **Dr. Diptasri Mandal**
Time: **Tuesdays 9:00 am – 11:00 am;**
Thursdays 2:00 – 4:00 pm; Fridays 9:00am – 11:00am
Location: CSRB 752A for Tuesdays, Thursdays (unless indicated by an asterisk) and Fridays
Course Credits: **3**

Course Description: An introduction to the fundamental elements of mathematical and population genetics. Topics include probability, Bayes' theorem, Hardy-Weinberg equilibrium, inbreeding, selection mutation, models for polygenic and multifactorial inheritance, linkage and simple segregation analysis.

Population Genetics

Aug. 23	Intro to population Genetics, Allele frequency estimation, review Hardy-Weinberg Equilibrium [Dr. Mandal]
Aug. 25	Inbreeding, Random Drift, Mutation, Selection, and Migration [Dr. Mandal]
Aug. 30	Bayesian probability Genetic counseling [Dr. Mandal]
Sept. 1	Zygosity & Paternity testing [Dr. Mandal]
Sept. 6	Forensic Genetics [Dr. Mandal]
Sept. 8*	Test (*Genetics conference room)

Genetic Epidemiology

Sept. 13	Overview of Genetic Epidemiology [Dr. Mandal]
Sept. 15	Segregation analysis [Dr. Mandal]
Sept. 20	**No classes (Study Section meeting)**
Sept. 22	Linkage analysis [Dr. Mandal]
Sept. 27	Quantitative trait linkage analysis Nonparametric linkage analysis [Dr. Mandal]
Sept. 29	Hapmap project and its applications [Dr. Mandal]

Oct. 4	Genome Wide Association Studies [Dr. Mandal]
Oct. 6	Genetic Epidemiology & Public Health Ethical, legal and social issues [Dr. Mandal]
OCT 11-14	**No classes (ASHG meeting)**

Use of Population genetics & human Genome Epidemiology to improve health

Oct. 18	Models of human diseases [Dr. Pandey]
Oct. 21 (FRIDAY)	Genetic counseling in clinic setting [Chris Dvorak, Certified Genetic Counselor, Tulane]
Oct. 25	From genetics to therapeutics [Dr. Wang]
Oct. 28 (FRIDAY)	Pharmacogenetics [Dr. Weissbecker, Tulane]
Nov. 1	Functional studies in disease gene identification [Dr. Liu]
Nov. 3	Test
Nov. 8	Student presentation [Dr. Mandal]

Grading: Homework (25%)
Two exams (25%, 40%; 65% total)
Student presentations (10%)

Texts & Recommended Reading: The following textbooks are recommended to help you with various topics covered.

Hartl and Clark: Principles of Population Genetics
Haines and Pericak-Vance: Approaches to Gene Mapping in Complex Human Diseases
Rao and Province: Genetic Dissection of Complex Traits
Khoury, Beaty and Cohen: Fundamentals of Genetic Epidemiology
Journal papers from Lancet (Genetic Epidemiology Series) Vol 366, 2005

Student Presentations:

Each student will select a disease or trait and find a recent (within the last 2 years) original research paper from the literature that uses one of the methods taught in the class. The selection **must** be pre-approved by the instructors. The student will then make a 15-minute power point presentation of the paper to the class at the end of the semester. All students **must** attend all sessions of student presentations, even if they are not presenting themselves.