REQUIRED TEXT: Korf & Irons – Human Genetics and Genomics (4th ed) – 2 copies are on reserve in the library.

Additional material is on D2L

Depending on your background one of the following may also be of interest:

More molecular
Strachan & Read – Human Molecular Genetics 4 – 3rd edition is on Reserve

More elementary
Mange & Mange – Genetics: Human Aspects (out of print) – 2nd edition on Reserve
Lewis – Human Genetics: Concepts and Applications – 10th edition on Reserve

PLEASE NOTE: Bi 341 or equivalent is expected/required for this course.

General objectives: To acquaint students with terminology, current research and issues in a variety of areas of human genetics, including: pedigree and chromosomal analysis, development, sex determination, imprinting, metabolic pathways, gene families and gene organization, genome mapping, epigenetics, bioethics and cancer genetics. Our emphasis will be to look at techniques used to define normal, as well as, abnormal patterns and disorders.

Class organization: There will be lectures, class discussions, special assignments, presentations and guest speakers.

Grading: Weekly reading summaries &/or assignments (150 pts), Pedigree Quiz (50 pts), Midterm (150 pts), Final (150 pts).

PROPOSED TOPICS (*subject to change based on speaker availability*)

Date: Weeks 1-10 Topic
-------------------------------------------------------------------------------------------------
Week 1: Jan 9-11 Pedigree Analysis, Mendelian Disorders

ASSIGNMENT: for Wed (Jan 11th): Explore OMIM/GeneReviews and find a description of a single gene Mendelian disorder. Hand in a 1 pg. summary to include: a)
a description of the disorder, b) the mode of inheritance, c) the gene responsible and where it is located on the chromosomes, d) the frequency of occurrence (prevalence), and e) if available, the molecular – developmental - physiological consequence of the gene defect. In class, you will be asked to briefly describe what you have found.

----------------------------------------

Week 2: Jan 16-18  Chromosomes, Syndromes; Clinical Cytogenetics
* Mon (Jan 16): Martin Luther King Holiday

* Wed (Jan 18): Clinical Cytogenetics
1. Guest speaker – Dr. Susan Olson, Professor, Molecular & Medical Genetics, Director of the Cytogenetics Diagnostic Laboratory, OHSU
2. Weekly current journal article summary due – discussion

----------------------------------------

Week 3: Jan 23-25 Sex Determination, Developmental Disorders
* Mon (Jan 23): Sex Determination and associated disorders

* Wed (Jan 25): 1. Guest speaker – Dr. Cheryl Maslen, Professor, Knight Cardiovascular Institute and Department of Molecular & Medical Genetics, Director Northwest Center for Aortic Aneurysm Research, Director, Program in Molecular and Cellular Biosciences
2. Weekly current journal article summary due - discussion

----------------------------------------

Week 4: Jan 30-Feb 1  Development, Imprinting & Epigenetics
* Mon (Jan 30): Development, imprinting

* Wed (Feb 1): 1. Epigenetics
2. Weekly current journal article summary due - discussion

----------------------------------------

Week 5: Feb 6-8
**MON. FEB 6 - MIDTERM - No make-ups**

* Wed Feb 8: Metabolic pathways/Inborn Errors of Metabolism

----------------------------------------

Week 6: Feb 13-15  Mapping & Linkage Analysis, Gene Families

* Mon (Feb 13): Mapping & Linkage Analysis

* Wed (Feb 15): 1. Human Hemoglobins, Gene Families
2. Weekly current journal article summary due - discussion
Week 7: Feb 20-22  Mapping Complex Disease; Bioethics
 * Mon (Feb 20): Bioethics & Ethical Issues of Genetic Testing

 ASSIGNMENT: for Mon Feb 20. Panel on Bioethics. Format and readings will be discussed and assigned in class on Feb 15.

 * Wed (Feb 22): Mapping complex disease - Guest speaker. Amanda Vinson, Asst. Professor, Dept. of Medical Informatics and Clinical Epidemiology, OHSU; Asst. Scientist, Div. of Neuroscience, OR National Primate Research Center

-------------------------------------------------------------------

Week 8: Feb 27-Mar 1  The Human Genome, Cancer Genetics
 * Mon (Feb 27): 1. The human genome – Guest speaker. Dr. Kim Brown PSU
   2. Weekly current journal article summary due - discussion

 * Wed (Mar 1): Cancer genetics I - Guest speaker. Dr. Jeff Singer, Biology PSU

-------------------------------------------------------------------

Week 9: Mar 6-8  Cancer Genetics, Disease and Metagenomics
 * Mon (Mar 6): Cancer Genetic II – Guest Speaker, Dr. Justin Courcelle PSU

 * Wed (Mar 8): 1. Disease and metagenomics - Guest Speaker. Dr. Rahul Raghavan, Biology PSU
   2. Weekly current journal article summary due - discussion

-------------------------------------------------------------------

Week 10: Mar 13-15 ASSIGNMENT: Student Presentations
 * Mon (Mar 13): Bi 428 Student presentations (4-5 min ppt on genetic disorder/topic of choice)

 * Wed (Mar 15): 1. Bi 528 student presentations
   2. Selected Bi 428 student presentations & wrap-up

-------------------------------------------------------------------

** MAR 20 MONDAY: 17:30-19:20  FINAL EXAM **

Class Expectations and Conditions:
* All students are required to read a current journal article for weeks 2, 3, 4, 6, 8 and 9. You will give a short synopsis of that article and hand in a 1 pg. summary of the article in the discussion times indicated in the syllabus. Summaries must include the full reference (authors, title, journal, volume, pages) as well as a brief summary. There are three required Assignments; the first is the OMIM assignment of Week 1, the second is the Bioethics assignment of Week 7 and the third is the final presentation assignment of Week 10. Description of what these entail will be given in class.

* The Midterm will cover material of the first four weeks. The final will cover weeks 5-10. Material presented by guest speakers will be on the exams. Study guides will be provided. There are NO make-ups.

* Use of Electronic devices is NOT allowed at any time in class: no cell phones, iphones, ipads, computers, smart watches, etc. Come to class prepared with pen/pencil and paper. * If you come in late, it disturbs the class – strive to be on time!

Portland State is committed to providing an environment free of all forms of prohibited discrimination and sexual harassment (sexual assault, domestic and dating violence, and gender or sex-based harassment and stalking). If you have experienced any form of gender or sex-based discrimination or sexual harassment, know that help and support are available. PSU has staff members trained to support survivors in navigating campus life, accessing health and counseling services, providing academic and on-housing accommodations, helping with legal protective orders, and more. Information about PSU’s support services on campus, including confidential services and reporting options, can be found on PSU’s Sexual Misconduct Prevention and Response website at: [http://www.pdx.edu/sexual-assault/get-help](http://www.pdx.edu/sexual-assault/get-help) or you may call a confidential IPV Advocate at 503-725-5672. You may report any incident of discrimination or discriminatory harassment, including sexual harassment, to either the Office of Equity and Compliance or the Office of the Dean of Student Life.