Human Molecular Genetics (GENET231) – 3 credits

Lecture location and time: Lectures/discussions will be conducted in Drs Crabtree or Gregory's office, every Monday and Wednesday from 10-11:30am.

Required textbook: "Human Molecular Genetics" 4th edition by Tom Strachan and Andrew Read (ISBN: 978-0-815-34149-9) – available in the bookstore. In the event that a lecture is derived from a different source, photocopies will be provided.

Date	Lecture Topic	Reading/chapter	Instructor
MODULE 1:	**The Human Genome**		
Wed, Aug. 14	Course overview		Gregory
Mon, Aug. 19	The Human Genome Project	1,2, article 1	Crabtree
Wed, Aug. 21	Organization of the Genome	8	Crabtree
Mon, Aug. 26	Organization of the Genome	9	Crabtree
Wed, Aug. 28	SNP/HapMap/ENCODE	13, articles 3,4	Crabtree
Mon, Sept. 1	Labor Day – no class		
Wed, Sept. 4	Sequencing Methodology		Crabtree
Mon, Sept. 9	Sequencing Methodology	article 2	Crabtree
Wed, Sept. 11	Genotype/Phenotype Correlation	13.5, 18	Crabtree
Mon, Sept. 16	Review		Crabtree
Wed, Sept. 18	**Exam #1 – Module #1**		Crabtree
MODULE 2	**Cancer Genetics and Project**		
Mon, Sept. 23	Problem Based Learning		Gregory
Wed, Sept. 25	Oncogenes	17	Gregory
Mon, Sept. 30	Tumor Suppressors	17	Gregory
Wed, Oct. 2	Chromosomal Instability	17	Gregory
Mon, Oct. 7	DNA Repair	17	Gregory
Wed, Oct. 9	Discussion		Gregory
Mon, Oct. 14	Design of Case Study for PBL		
Wed, Oct. 16	Hereditary Cancer Syndromes		
Mon, Oct. 20	Independent work on PBL		
Wed, Oct. 23	Discussion & Refinement of PBL		
Mon, Oct. 28	**Exam #2 – Module #2**		
MODULE 3	**Personalized Medicine**		
Wed, Oct. 30	Whole genome sequencing-applications		Gregory
Mon, Nov. 4	Gene therapy	21	Gregory
Wed, Nov. 6	Pharmacogenomics	19	Gregory
Mon, Nov. 11	Pharmacogenomics	4,5	Bunnell
Wed, Nov. 13	Stem Cells		Gregory
Mon, Nov. 18	Stem Cells/iPSC		
Wed, Nov. 20	Microbiome		
Mon, Nov. 25	Thanksgiving holiday – no class		
Wed, Nov. 27	Thanksgiving holiday – no class		
Mon, Dec. 2			
Wed, Dec. 4	**Exam #3 – Module 3**		

Grading: Grades will be determined through a combination of directed study and three in-class, closed notebook exams. All exams will carry equal weight.

Course Director information:

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Review Articles:

Module 1:

1) Green and Guyer. Charting a course for genomic medicine from base pairs to bedside. Nature 470:204-213.
2) Michael L. Metzker. Sequencing Technologies – the next generation. Nature Reviews Genetics 11:31-46 (2010)
3) The ENCODE Project Consortium. An integrated encyclopedia of DNA elements in the human genome. Nature 489: 57-72 (2012).
4) Nature ENCODE - explore this website:
   http://www.nature.com/encode/#/threads

Module 2:

Module 3: