

BIOINFORMATICS RESOURCES FOR GENETICISTS
HUGEN 2010

FALL 2019 · SYLLABUS

Instructors

Ryan L. Minster, Ph.D., M.S.I.S.
rminster@pitt.edu
3118 Public Health
Office hours by appointment
Phone: 412-624-6928

Kang-Hsien “Frank” Fan, Ph.D.
frank.fan@pitt.edu
3123 Public Health
Office hours by appointment
Phone: 412-624-5383

Class

Friday, 10:00 AM–11:25 AM in A215 Parran Hall

Credits

1 credit

Description

The focus of this course is the online bioinformatics 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.

Prerequisites/Corequisites

HUGEN 2022 · Human Population Genetics
HUGEN 2040 · Molecular Basis of Human Inherited Disease

Objectives

Upon successful completion of this course students will be able to

- Name and locate online resources for literature searches; phenotypes and genetic disorders; genes; genetic variation; ontologies; biological pathways and networks; comparative genomics; and genotype–phenotype associations
- Describe the type of information available in each online resource
- Query each online resources for information

Learning Activities

Class sessions will consist of 10 minutes to 15 minutes of lecture followed by the instructor leading the class through an interactive session with each bioinformatics resource.

Assessments

Course grade is determined based on student's performance on ten online assignments and a final in-class group activity. There are eleven online assignments. The assignment with the lowest grade will be dropped, and each of the remaining ten activities will account for 9% of the final grade. The final in-class group activity will account for 10% of the final grade.

Assignments consist of answering a series of questions posed online through a Google Form. For each bioinformatics resource—outlined in the schedule—students will be asked to find information using that resource.

The final in-class group activity will consist of each group answering a series of questions on paper about a phenotype and related genes and genetic variants. For each question the students will also be asked to identify the resource they used to answer the question.

Grading Scale

Score	Grade
≥ 93%	A
< 93% & ≥ 83%	B
< 83% & ≥ 73%	C
< 73% & ≥ 63%	D
< 63%	F

Course Materials

Lecture notes and other course materials will be posted on Canvas.

Required Equipment and Software

All students will need access to a laptop computer with a web browser (Google Chrome, Safari, Firefox, Internet Explorer, Opera) and connectivity through wifi to PittNet. Students who do not have a laptop may borrow a laptop from the Department of Human Genetics for use in class. Contact the instructor for more information on borrowing a laptop.

Recommended Readings

There is no required textbook for this course. Recommended and optional readings will be made available of CourseWeb.

Tentative Schedule

Fri Aug 30	Introduction to Bioinformatics & Literature Informatics	NCBI, HSLs, PubMed, MyNCBI
Fri Sep 6	No Class	(Human Genetics Retreat at Pymatuning Reservoir)
Fri Sep 13	Genome Browsers I	UCSC Genome Browser etc.
Fri Sep 20	Genome Browsers II	UCSC Genome Browser etc.
Fri Sep 27	Proteomics	UniProt, etc.
Fri Oct 4	Variation Databases	dbSNP, ExAC, gnomAD, BRAVO, GGV, 1000G, SNPedia etc.
Fri Oct 11	Phenotype–Genotype Associations	PheGenI, GWAS Catalog etc.
Fri Oct 18	No Class	(ASHG)
Fri Oct 25	Cancer Genetics & Genomics	TCGA
Fri Nov 1	Clinical Relevance <i>Guest Lecturer: Natalie Carter, M.S., C.G.C.</i>	ClinVar, OMIM, GTR, GeneTests etc.
Fri Nov 8	Comparative Genomics	UCSC GB, MGI, Flybase, Wormbase, ZFIN etc.
Fri Nov 15	Gene Regulation	GTEX, RegulomeDB, HaploReg etc.
Fri Nov 22	Ontologies, Pathways & Networks	Pathway Commons, Gene Ontology etc.
Fri Nov 29	No Class	(Thanksgiving)
Fri Dec 6	Final Comprehensive Activity	

Additional Resources

Additional bioinformatics resources, software and training can be found through the Molecular Biology portal of the Health Science Library System (www.hsls.pitt.edu/molbio).

Contact Carrie Iwema (iwema@pitt.edu) or Ansuman Chattopadhyay (ansuman@pitt.edu) for additional information.

Accommodation for Students with Disabilities

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services, 140 William Pitt Union, 412-648-7890 as early as possible in the term.

Academic Integrity

All students are expected to adhere to the School's standards of academic honesty. Cheating/plagiarism will not be tolerated. The Graduate School of Public Health's policy on academic integrity, which is based on the University policy, is available online in the Pitt Public Health Academic Handbook www.publichealth.pitt.edu/home/academics/academic-requirements. The policy includes obligations for faculty and students, procedures for adjudicating violations, and other critical information. Please take the time to read this policy.

Sexual Misconduct, Required Reporting, and Title IX

The University is committed to combatting sexual misconduct. As a result, you should know that University faculty and staff members are required to report any instances of sexual misconduct, including harassment and sexual violence, to the University's Title IX office so that the victim may be provided appropriate resources and support options. What this means is that as your professors, we are required to report any incidents of sexual misconduct that are directly reported to us, or of which we are somehow made aware.

There are two important exceptions to this requirement about which you should be aware:

A list of the designated University employees who, as counselors and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: www.titleix.pitt.edu/report/confidentiality

An important exception to the reporting requirement exists for academic work. Disclosures about sexual misconduct that are shared as part of an academic project, classroom discussion, or course assignment, are not required to be disclosed to the University's Title IX office.

If you are the victim of sexual misconduct, Pitt encourages you to reach out to these resources:

- Title IX Office: 412-648-7860
- The Office of Sexual Harassment and Assault Response and Education (SHARE) at the University Counseling Center: 412-648-7930 (8:30 AM to 5 PM Monday–Friday) and 412-648-7856 (after business hours)

If you have a safety concern, please contact the University of Pittsburgh Police, 412-624-2121.

Other reporting information is available here: www.titleix.pitt.edu/report

Statement from the Department of Gender, Sexuality, and Women's Studies

[This statement was developed by Katie Pope, Title IX Coordinator, in conjunction with GSWS instructors.]

Diversity

The University of Pittsburgh Graduate School of Public Health considers the diversity of its students, faculty, and staff to be a strength and critical to its educational mission. Pitt Public Health is committed to creating and fostering inclusive learning environments that value human dignity and equity. Every member of our community is expected to be respectful of the individual perspectives, experiences, behaviors, worldviews, and backgrounds of others. While intellectual disagreement may be constructive, no derogatory statements, or demeaning or discriminatory behavior will be permitted.

If you feel uncomfortable or would like to discuss a situation, please contact any of the following:

- the course instructor;
- the Pitt Public Health Associate Dean for Diversity at 412-624-3506 or nam137@pitt.edu;
- the University's Office of Diversity and Inclusion at 412-648-7860 or www.diversity.pitt.edu/make-report/report-form (anonymous reporting form).