

Certificate in Computational Genetics

The Department of Genetics offers a **Certificate in Computational Genetics (CCG)**. The volume of data being generated in Genetics and related life science fields has been expanding tremendously in recent years, and career opportunities for geneticists with computational and quantitative expertise are simultaneously growing. This certificate program is intended for students who are either interested in applying to graduate-level programs, or planning careers, in Computational Genetics, Statistical Genetics, Bioinformatics, or other programs in quantitative biomedical related research. The goal of the CCG is to provide students with guidance, coursework, and relevant data design and analysis experience to prepare them for graduate studies in the field. This program is only open to declared Genetics Majors. The Certificate will be awarded only in conjunction with the awarding of a baccalaureate degree in Genetics. At the end of the program students will:

- Have gained competence in genetic data analysis using basic computer programming and statistical analysis.
- Be prepared to apply to M.S. or Ph.D. graduate programs in the areas of Computational Genetics and Bioinformatics.
- Be prepared to apply for career positions in industry, biotech companies, pharmaceutical companies, medical centers, or universities.

Students accepted into the certificate program will meet regularly with the CCG director and conduct research in a Computational Genetics lab for at least two semesters. Completion of the certificate will require an additional 4-7 credits beyond those needed to complete the Genetics major, depending on how many credits of Research in Genetics are taken. Interested students should contact Dr. Derek Gordon (gordon@biology.rutgers.edu).

Proposed Courses Required for Certificate (in conjunction with other Genetics major requirements):

Department	Course Number	Name	Credits
447 (Genetics)	203 or 302 or 303	Quant Biol and Bioinform Computational Genetics ¹	3
447 (Genetics)	406, 407	Research in Genetics ^{1,2}	3,3/6,6 (H)
960 (Statistics)	379	Basic Probability ^{1,3}	3
960 (Statistics)	384 or 401	Intermediate Stat Analysis ⁴ or Basic Statistics for Research	3
198 (Comp. Sci.)	111	Intro to Comp Sci ⁴	3
198 (Comp. Sci.)	112	Data Structures ⁴	4

¹ These courses satisfy Genetics Major requirements.

² All Genetics majors are required to take at least 2 semesters (6-12 credits) of Research in Genetics. Students in the Computational Genetics certificate program will do research in computational labs.

³ 960:381 may be substituted for 960:379.

⁴ These courses may be used to fulfill the elective requirements of the Genetics major.

Prerequisites for Certificate Program:

1. Undergraduate student in Department of Genetics
2. Have a minimum 2.8 GPA.
3. Application interview with Dr. Derek Gordon (CCG Director).