

SEQUENCE ANALYSIS AND GENOMICS, POST-MASTER'S CERTIFICATE

Post-Master's Certificate in Sequence Analysis and Genomics (<https://advanced.jhu.edu/academics/certificates/sequence-analysis-genomics/>)

The field of bioinformatics is continually expanding and challenging our ability to bridge the gap between molecular biology and computer technology. Specifically, the revolution in sequencing technology has resulted in vast quantities of data that require storage and analysis. The analysis of nucleic acid and protein data requires specialized bioinformatics tools and an understanding of genomics. The emerging sequencing technologies and accompanying bioinformatics tools will advance personalized medicine, pharmacogenomics, and molecular diagnostics methods. The advancement of these tools will open new avenues of research on many fronts.

This certificate is targeted at scientists who already have grounding in biochemistry, molecular biology, and cell biology, and do not need advanced computer skills. It introduces students to the foundations of bioinformatics through the core bioinformatics courses, and then the students take upper-level courses that are required for understanding and performing sequence and genomic analysis. The program is offered both online and onsite.

Admissions Criteria for all Advanced Academic Programs (<https://e-catalogue.jhu.edu/arts-sciences/advanced-academic-programs/enrollment-services/admission/>)

PROGRAM-SPECIFIC REQUIREMENTS

Applicants to this program must have a master's or doctoral degree in the biological sciences or engineering from an accredited institution, as well as:

- One semester of biochemistry or equivalent
- One semester of molecular biology or equivalent

| Code | Title | Credits |
|---------------------------------|--|---------|
| Core Courses - Required: | | |
| AS.410.633 | Introduction to Bioinformatics | 4 |
| AS.410.634 | Practical Computer Concepts for Bioinformatics | 4 |
| AS.410.635 | Bioinformatics: Tools for Genome Analysis | 4 |
| or AS.410.666 | Next Generation DNA Sequencing and Analysis | |
| Elective Courses | | |
| Select two of the following: | | 8 |
| AS.410.635 | Bioinformatics: Tools for Genome Analysis | |
| AS.410.639 | Protein Bioinformatics | |
| AS.410.640 | Molecular Phylogenetic Techniques | |
| AS.410.645 | Biostatistics | |

| | |
|----------------------|---|
| AS.410.666 | Next Generation DNA Sequencing and Analysis |
| AS.410.671 | Gene Expression Data Analysis and Visualization |
| AS.410.709 | Cancer Genomics |
| AS.410.712 | Advanced Practical Computer Concepts for Bioinformatics |
| AS.410.713 | Advanced Genomics and Genetics Analyses |
| AS.410.734 | Practical Introduction to Metagenomics |
| AS.410.736 | Genomic and Personalized Medicine |
| Total Credits | 20 |

See course requirements in the Center for Biotechnology Education (https://e-catalogue.jhu.edu/course-descriptions/_biotechnology/).