BIOINFORMATICS (BIOI)

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BIOI 300 Directed Readings (1-3 Credit Hours)
Readings from the scientific literature in any focused area of bioinformatics agreed upon by the student and the supervising faculty member.
Outcomes:
Students will gain knowledge, journal reading expertise, and scientific writing skills

BIOI 365 Exploring Proteins (3 Credit Hours)
Pre-requisites: Bioinformatics Majors only and CHEM 361
Computational tools are essential for the prediction of protein structures, protein interactions, and structure based drug design. This class will introduce fundamental concepts in the field of computational protein biology.
Outcomes:
Students will obtain a general understanding of the principles of proteomics in addition to theoretical and practical experience with protein-based databases and bioinformatics tools to explore protein structure and function

BIOI 395 Special Topics: Bioinformatics (1-3 Credit Hours)
Special areas of bioinformatics outside the usual curriculum that vary each time the course is offered.
Outcomes:
Students will gain knowledge in and master a unique topic in bioinformatics

BIOI 397 Bioinformatics Survey (1-4 Credit Hours)
Pre-requisites: BIOL 101 and Instructor consent
This course trains students in conducting collaborative bioinformatics research as well reading and presenting scientific research.
This course satisfies the Engaged Learning requirement.
Outcomes:
Provides an alternative to individual research; reflects trends in the field for collaborative, group research

BIOI 398 Bioinformatics Internship (1-4 Credit Hours)
An independent research experience involving laboratory experiments, computer program development, or statistical analysis or any combination of these performed off-campus under the mentorship of a Bioinformatics scientist not affiliated with Loyola.
Interdisciplinary Option: Bioinformatics
This course satisfies the Engaged Learning requirement.
Outcomes:
All students will acquire skills to perform and report on independent research and to be intellectually responsible for evaluating their own and related work; Other outcomes will include at least one of the following: Experimental expertise, statistical evaluation of data sets, design and use of computational tools

BIOI 399 Bioinformatics Research (1-4 Credit Hours)
An independent research experience involving laboratory experiments, computer program development, or statistical analysis or any combination of these performed under the mentorship of one or more Bioinformatics faculty members.
Interdisciplinary Option: Bioinformatics
This course satisfies the Engaged Learning requirement.
Outcomes:
All students will acquire skills to perform and report on independent research and to be intellectually responsible for evaluating their own and related work; Other outcomes will include at least one of the following: Experimental expertise, statistical evaluation of data sets, design and use of computational tools

BIOI 400 Programming Biology (1 Credit Hour)
This is a 6-week course introduction to scripting programming languages within the framework of biological data analysis. Graduate-level standing required. Students will learn foundational methods and algorithms for analysis of biological data.

BIOI 494 Bioinformatics Research Design (1 Credit Hour)
Course Restricted to Bioinformatics MS students Research practices, including data collection and management, the experimental design process, and tools for critical analysis and preparation of scientific literature will be discussed.
Outcomes:
Students can describe and implement experimental design practices in bioinformatics

BIOI 495 Special Topics in Bioinformatics (1-12 Credit Hours)
The field of bioinformatics is ever evolving. As new technologies develop, demand arises for new methods and tools. Courses will focus on emerging trends in bioinformatics. Restricted to Bioinformatics Graduate Students. Student will learn about emerging topics in the field.

BIOI 498 Bioinformatics Internship (1 Credit Hour)
Pre-requisites: BIOI 500
An opportunity to obtain experience, knowledge, and skills in bioinformatics within a professional setting and thus expand the depth and breadth of the student's learning. Limited to MS Bioinformatics Non-Thesis track students only.
Outcomes:
Students can apply foundational principles in bioinformatics into practice

BIOI 499 Bioinformatics Research (1-12 Credit Hours)
Pre-requisites: Prerequisite: BIOI 494
Students will conduct independent hypothesis-driven bioinformatics research under faculty guidance. Research efforts will include literature surveys, experimental design, algorithm and software development, and data analysis. Limited to MS Bioinformatics Thesis track students only.
Outcomes:
Students can develop and utilize techniques for bioinformatics research

BIOI 500 Advanced Bioinformatics (3 Credit Hours)
Pre-requisites: BIOL 388 or BIOL 488
Students will study fundamental bioinformatics algorithms and emerging software tools in the field. The course will include the study of primary literature and design and implementation of bioinformatics algorithms.
Course equivalencies: X- BIOI 500 /BIOL 450
Outcomes:
Students can describe, design, implement, and evaluate bioinformatics algorithms

BIOI 501 Bioinformatics Seminar (1-2 Credit Hours)
Pre-requisites: BIOL 388 or BIOL 488
The seminar will introduce students to current topics in bioinformatics through presentations given by leaders in bioinformatics research. This course will also include more formal training in scientific presentation skills.
Course equivalencies: X-BIOI501/BIOL451
Outcomes:
Students can summarize, critique, and present bioinformatics research

BIOI 565 Exploring Proteins (3 Credit Hours)
Pre-requisites: Biochemistry, restricted to Bioinformatics Graduate Students
Proteins are polymer chains of amino acids that fold into compact states that differ in structure, size, shape, and dynamics. Computational tools are essential for the prediction of protein structures, protein interactions, and structure-based drug design.
Outcomes:
Students will learn the concepts of building blocks of protein structure, and protein folding

BIOI 595 Thesis Supervision (1 Credit Hour)
Pre-requisites: BIOI 499
Laboratory research under faculty guidance including training in scientific writing and the production of a thesis and research presentation.
Outcomes:
Students will develop skills in scientific writing and presentation; At the conclusion, students will present (written and oral) the results of their research

BIOI 605 Master's Study (0 Credit Hours)
This course provides FT status for a student who needs to meet the continuous enrollment requirement of the Graduate School while completing program requirements.