BIOINFORMATICS/ COMPUTATIONAL BIOLOGY (BCB)

BCB 404 (s) Special Topics (1-16 credits, max arranged)

BCB 500 Master's Research and Thesis (1-16 credits)
Credit arranged

BCB 501 (s) Seminar (1-16 credits, max arranged)
Credit arranged. Students are required to attend all of the invited speaker presentations in the IBEST/CMCI/BCB seminar series for the semester they are enrolled. Students who miss one or more presentations are expected to attend an alternative seminar approved by the instructor. Additional meetings may be required by the instructor.

BCB 502 (s) Directed Study (1-16 credits)
Credit arranged

BCB 503 (s) Workshop (1-16 credits)
Credit arranged

BCB 504 (s) Special Topics (1-16 credits)
Credit arranged

BCB 506 Laboratory Experience in the Biological Sciences (1-16 credits, max arranged)
Credit arranged. Hands-on activities in an active research laboratory whose central research interests are in the biological or biochemical sciences.
Prereqs: Admission to BCB program.

BCB 507 Laboratory Experience in the Computational Sciences (1-16 credits, max arranged)
Credit arranged. Hands-on activities in an active research laboratory whose central research interests are in the computational sciences.
Prereqs: Admission to BCB program.

BCB 508 Laboratory Experience in Mathematics or Statistics (1-16 credits, max arranged)
Credit arranged. Hands-on activities in an active research laboratory whose central research interests are in the mathematics or statistics.
Prereqs: Admission to BCB program.

BCB 520 Foundations of Data Visualization (3 credits)
This class will help students establish a foundational understanding of data visualization. We will consider how data type (including tabular, network, and spatial data) interacts with visualization task to guide design choices. Diverse types of visual encodings and how they relate to human perception will be presented, along with practical exercises using the R programming language. Upon completion of the course, students will understand why particular visualization approaches are effective for a given data set and how to implement those visualizations using R. The course is designed to be "discipline agnostic": each student is encouraged to use data sets that they deem important/interesting. The goal is to have students learn how to develop visualizations that are relevant to their own disciplinary interests. Typically Offered: Spring.
Prereqs: INTR 509 or STAT 251

BCB 521 Communicating with Data (2 credits)
Students are taught writing and presentation skills to improve their communication of data-driven insights to specialist and lay audiences. The course emphasizes reproducible research practices, including literate programming (Quarto / Markdown) and version control (GitHub). Course content includes the conceptual foundations of communicating with data along with written and verbal assignments using data sets individualized to each student's interest. Typically Offered: Spring.
Prereqs: INTR 509 or BS degree

BCB 522 Data Science Portfolio (1 credit)
This course provides feedback, review, and approval of the student's online data science portfolio. This portfolio is intended to represent the body of work accumulated by the student over the course of the certificate in Professional Applications of Data Science. It should contain examples of novel data products (such as FAIR data sets), analyses, and visualizations. All elements of the portfolio will be hosted online (likely in a GitHub repository or professional website), be open source, and demonstrate best practices of literate programming and reproducible research. Typically Offered: Varies.
Prereqs: INTR 509 or BS degree

BCB 524 (s) Data Carpentries (1-2 credits, max 6)
Cross-listed with AVFS 524
This series of hands-on workshops will cover basic concepts and tools for processing data and reproducibly performing data analyses. This includes spreadsheet management, program design, data visualization in R and Python, and task automation in Unix, R, or Python - depending on the session. We will cover best practices for collecting and organizing data to streamline data processing and statistical analyses. Participants will be encouraged to help one another and to apply what they have learned to their own research problems. The course is aimed at graduate students and other researchers that are working with scientific data but is open to undergraduate students with instructor permission. Graded Pass/Fail. Typically Offered: Fall and Spring.
Prereqs: Senior or graduate status, or instructor permission.

BCB 597 (s) Practicum (1-16 credits)
Credit arranged

BCB 598 (s) Internship (1-16 credits)
Credit arranged

BCB 599 (s) Non-thesis Master's Research (1-16 credits)
Credit arranged

BCB 600 Doctoral Research and Dissertation (1-45 credits)
Credit arranged