BIOMEDICAL INFORMATICS (BIO MD INF)

Course List

BIO MD INF 203 Biocomputing Algorithms (4 Units)

Offered In: Winter
Instructor(s): Tony Capra
Prerequisite(s): Students are expected to have programming competence in a language such as Python, C, C++, or Fortran. Students should also posses a basic knowledge of statistics (undergrad. level). In addition, to take the course, all incoming for-credit students must pass a brief programming background technical assessment, conducted with a TA by Zoom. It is the students responsibility to arrange a meeting for the assessment.

Restrictions: For all iPQB students and Bioengineering students. Others require instructor approval.

Activities: Lecture

Introduction to computational issues and methods used in the field of bioinformatics and computational biology. This course emphasizes the implementation, analysis, and validation of methods. It is about attacking computational problems in biology, not expert use of existing tools. Areas addressed include analytical thinking, problem decomposition, and algorithm design and implementation. Assignments will focus on the design and implementation of key bioinformatics algorithms.

School: Graduate Division
Department: Biological And Medical Informatics Program
May the student choose the instructor for this course? No
Does enrollment in this course require instructor approval? No
Course Grading Convention: Letter Grade
Graduate Division course: Yes
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? No

BIO MD INF 206 Statistical Methods for Bioinformatics (4 Units)

Offered In: Fall
Instructor(s): Katie Pollard
Prerequisite(s): Upper division course work in biological sciences including knowledge of proteins and protein structure, computer literacy.

Restrictions: None.

Activities: Lecture, Project

Broad survey of bioinformatics with accompanying assignments. Topics covered include genomics, database searching, family/super-family analysis, structural genomics, complex systems, genetic circuits, and protein-protein interactions.

School: Graduate Division
Department: Biological And Medical Informatics Program
May the student choose the instructor for this course? No
Does enrollment in this course require instructor approval? No
Course Grading Convention: Letter Grade
Graduate Division course: Yes
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? No

BIO MD INF 212 Deep Learning for Biological and Clinical Research (5 Units)

Offered In: Winter
Instructor(s): Reza Abbasi-Asl
Prerequisite(s): Experience with numerical computation in Python is required.

Restrictions: None.

Activities: Lecture, Seminar, Project

This course will establish the foundations of deep learning through lectures, weekly seminars, and a hands-on approach in Python. We will cover the basics of regression and classification, model optimization, and neural network architectures, including autoencoders, convolutional networks, and transformers, with the use cases of these models in biological and clinical research. This is the same class as BIOENGR 212. Students should ensure they are registering with the right course number.

School: Medicine
Department: Neurology
May the student choose the instructor for this course? No
Does enrollment in this course require instructor approval? No
Course Grading Convention: Letter Grade
Graduate Division course: No
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? No

BIO MD INF 219 Special Topics in Bioinformatics (3 Units)

Offered In: Fall, Spring
Instructor(s): Staff
Prerequisite(s): None.

Restrictions: Priority given to first-year graduate students.

Activities: Lecture, Independent Study

Each course offering will focus on the literature of a current important area of Bioinformatics. Students will be expected to read assigned papers critically before class and to present and discuss papers in class. Students will also be expected to write and present a brief research proposal based upon their reading. Topics in Molecular, Cellular, developmental, systems, and computation biology will be covered in separate course offerings.

School: Graduate Division
Department: Biological And Medical Informatics Program
May the student choose the instructor for this course? Yes
Does enrollment in this course require instructor approval? No
Course Grading Convention: P/NP (Pass/Not Pass) or S/U (Satisfactory/Unsatisfactory)
Graduate Division course: Yes
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? Yes

BIO MD INF 220 Informatics Seminar (1 Units)

Offered In: Fall, Winter, Spring
Instructor(s): Ryan Hernandez
Prerequisite(s): None.

Restrictions: n/a

Activities: Lecture

This course consists of presentation and discussion of research in quantitative biology and bioinformatics by outside speakers.

School: Graduate Division
Department: Biological And Medical Informatics Program
May the student choose the instructor for this course? No
Does enrollment in this course require instructor approval? No
Course Grading Convention: P/NP (Pass/Not Pass) or S/U (Satisfactory/Unsatisfactory)
Graduate Division course: Yes
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? Yes

BIO MD INF 221 Informatics Rotation (1-8 Units)

Offered In: Fall, Winter, Spring, Summer
Instructor(s): Staff
Prerequisite(s): None

Restrictions: None

Activities: Lab science

An introduction to the specific research currently underway within a faculty member's laboratory.

School: Graduate Division
Department: Biological And Medical Informatics Program
May the student choose the instructor for this course? Yes
Does enrollment in this course require instructor approval? No
Course Grading Convention: Letter Grade, P/NP (Pass/Not Pass) or S/U (Satisfactory/Unsatisfactory)
Graduate Division course: Yes
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? Yes

BIO MD INF 222 Student Informatics Seminar (1 Units)

Offered In: Fall, Winter, Spring
Instructor(s): Ryan Hernandez
Prerequisite(s): None

Restrictions: Must be a student in the Biological & Medical Informatics Graduate Program

Activities: Seminar

This course gives students the opportunity to develop and polish their presentation and research skills. All second year and above BMI students present their research to other students, postdocs and faculty. Their presentations are critically evaluated and they are provided with constructive feedback regarding their discussion topic and presentation skills.

School: Graduate Division
Department: Biological And Medical Informatics Program
May the student choose the instructor for this course? No
Does enrollment in this course require instructor approval? No
Course Grading Convention: P/NP (Pass/Not Pass) or S/U (Satisfactory/Unsatisfactory)
Graduate Division course: Yes
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? Yes

BIO MD INF 223 Critical Topics in Biomedical Informatics (1 Units)

Offered In: Fall, Winter, Spring
Instructor(s): Jim Wells
Prerequisite(s): None.

Restrictions: None.

Activities: Seminar

Critical review of published scientific papers from scholarly journals, including comprehension, analysis and evaluation of published scientific data.

School: Graduate Division
Department: Biological And Medical Informatics Program
May the student choose the instructor for this course? No
Does enrollment in this course require instructor approval? No
Course Grading Convention: P/NP (Pass/Not Pass) or S/U (Satisfactory/Unsatisfactory)
Graduate Division course: Yes
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? Yes

BIO MD INF 250 Research (4-8 Units)

Offered In: Fall, Winter, Spring, Summer
Instructor(s): Staff
Prerequisite(s): None

Restrictions: None

Activities: Project

In this course, students will work together with a primary research advisor to select a research question and design a project workplace that will be carried out by the student. Through this activity, the student will gain experience in research strategy, learn techniques associated with modern biomedical research, and practice how to interpret results. At the conclusion of the course, the student will present on their progress.

School: Graduate Division
Department: Biological And Medical Informatics Program
May the student choose the instructor for this course? Yes
Does enrollment in this course require instructor approval? No
Course Grading Convention: P/NP (Pass/Not Pass) or S/U (Satisfactory/Unsatisfactory)
Graduate Division course: Yes
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? Yes

BIO MD INF 311 Curricular Development and Academic Leadership (0.5-4 Units)

Offered In: Fall, Winter, Spring
Instructor(s): Ryan Hernandez
Prerequisite(s): None

Restrictions: BMI students only

Activities: Seminar, Workshop, Lab science, Discussion

The Curricular Development & Academic Leadership course will offer training and leadership to prepare graduate students in scientific leadership roles in the classroom and beyond. Students will have a hands-on approach to structuring and executing a curriculum. Students must submit an application prior to course enrollment.

School: Graduate Division
Department: Biological And Medical Informatics Program
May the student choose the instructor for this course? No
Does enrollment in this course require instructor approval? Yes
Course Grading Convention: P/NP (Pass/Not Pass) or S/U (Satisfactory/Unsatisfactory)
Graduate Division course: Yes
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? No