CSC/CPE 448 Bioinformatics Algorithms

1. CSC/CPE 448 Bioinformatics Algorithms

2. credit units 4 contact hours 6

3. Course Coordinator: Alexander Dekhtyar


5. a. Course Description: Introduction to the use of computers to solve problems in molecular biology. The algorithms, languages, and databases important in determining and analyzing nucleic and protein sequences and their structure. 3 lectures, 1 laboratory. Crosslisted as CPE/CSC 448.

   b. Prerequisite: CSC/CPE 103 with a grade of C- or better, or BIO/CHEM 441 and senior standing, or consent of instructor.

   c. Required/Elective/Selective Elective for CPE, CSC, EE, SE

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6. a. Course Goals/Outcomes
   The student will be able to:
   • Know the main problems in the field of bioinformatics and computational molecular biology
   • Understand the key algorithms used to solve computational biology and bioinformatics problems
   • Model computational biology problems
   • Apply algorithmic techniques to solve problems in computational biology and bioinformatics
   • Gain experience working on software projects in multidisciplinary teams

   b. How Student Outcomes addressed
   (“B” = Basic level, “I” = Intermediate level, “A” = Advanced level)

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7. **Major Topics Covered: (number of lecture hours each)**

- Introduction to Bioinformatics (3)
- Statistical Analysis of DNA (3)
- Exact Sequence Matching (6)
- Palindrome detection (2)
- Genome Alignment (6)
- Clustering (3)
- Gene Prediction (3)
- Review and advanced topics (4)