

<b>Course Number</b>	<b>CS 438</b>	<b>Course Title</b>	<b>Bioinformatics Algorithms</b>			
<b>Semester Hours</b>	<b>3</b>	<b>Course Coordinator</b> SP20	<b>Xiaolan Huang</b>			
<b>Catalog Description</b>	This course is an introductory course on bioinformatics algorithms and the computational ideas that have driven them. The course includes discussions of different techniques that can be used to solve a large number of practical problems in biology.					
<b>Textbooks</b>						
SP21						
<p>Compeau, P. &amp; Pevzner, P.A. (2018). <i>Bioinformatics Algorithms</i>. 3<sup>rd</sup> Edition. ISBN 9780990374633.</p> <p>Jones, N. C. &amp; Pevzner, P. A. (2004). <i>An Introduction to Bioinformatics Algorithms</i>. MIT Press. ISBN: 9780262101066.</p>						
<b>References</b>						
<b>Course Learning Outcomes</b>						
<ul style="list-style-type: none"> <li>• To learn basic concepts in molecular biology.</li> <li>• To learn the basic algorithms used in bioinformatics applications.</li> </ul>						
<b>Assessment of the Contribution to Student Outcomes</b>						
<b>Outcome →</b>	1	2	3	4	5	6
<b>Assessed →</b>		X				X
<b>Prerequisites by Topic</b>						
CS 330 with a grade of C or better or graduate standing.						

**Major Topics Covered in the Course**

1. Molecular Biology Primer {7 classes}
2. Exhaustive Search {6 classes}
3. Greedy Algorithms {3 classes}
4. Dynamic Programming Algorithms {6 classes}
5. Divide-and-Conquer Algorithms {3 classes}
6. Graph Algorithms {6 classes}
7. Clustering and Trees {6 classes}
8. Randomized Algorithms {3 classes}