<table>
<tr><td>Course #:</td><td>CSCI-C 455</td></tr>
<tr><td>Course Title:</td><td>Analysis of Algorithms</td></tr>
<tr><td>Course Type:</td><td>Required core</td></tr>
<tr><td>Prerequisites:</td><td>C251 Foundations of Digital Computing, M209 Calculus II, M260 Probability</td></tr>
<tr><td>Credits:</td><td>4</td></tr>
<tr><td>Text Book:</td><td>Course notes by D. Vrajitoru and W. Knight</td></tr>
<tr><td>References:</td><td>Class notes</td></tr>
<tr><td>Current Catalog Description:</td><td>Mathematical analysis of time and space requirements for algorithms, using combinatorics, recurrence relations, and elementary probability theory. Advanced graph algorithms Tractable and intractable problems.</td></tr>
<tr><td>Course Goals</td><td>The student who completes this course:
Will be introduced to the theoretical foundations that would allow the students to compute the complexity of an algorithm
Will be able to recognize and distinguish efficient and inefficient algorithms.
Will be able to better choose from the most appropriate solution for a problem.</td></tr>
<tr><td>Major Topics Covered in the Course</td><td>Recurrence relations
Deterministic Analysis of Algorithms
Euclid's algorithm for the greatest common divisor
Binary trees
Priority queues and heaps
Divide and conquer algorithms
Sorting algorithms, lower bound theorem
Probabilistic analysis of algorithms
Random number generators, simulators
Randomizing arrays and files, random samples
Expected behavior of algorithms
Graph theory</td></tr>
<tr><td>Laboratory projects (specify number of weeks on each)</td><td>No closed laboratory</td></tr>
<tr><td>Estimate Curriculum Category Content (Semester hours)</td><td><table>
<tr><td>Area</td><td>Core</td><td>Advanced</td></tr>
<tr><td>Algorithms</td><td>40</td><td>10</td></tr>
<tr><td>Software Design</td><td>10</td><td></td></tr>
<tr><td>Comp. Arch.</td><td></td><td></td></tr>
<tr><td>Data Structures</td><td>10</td><td></td></tr>
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	Prog. Languages | | Additional hours may be dedicated to curriculum categories not listed above. For example explanation of concepts and theories. Discussion of social and ethical issues, discussion of inter personal relationships and working within groups.
Oral and Written Communications	Not a course objective.
Social and Ethical Issues	Not a course objective.
Theoretical Content	• Recurrence relations 9h • Deterministic Analysis of Algorithms 12h • Lower bound theorem for sorting algorithms, 1h • Probabilistic analysis of algorithms 8h • Graph theory 3h
Problem Analysis	
Solution Design	
Prepared By	Vrajitoru, Knight