

<b>Course #:</b>	<b>INFO-I 201</b>																		
<b>Course Title:</b>	<b>Mathematical Foundations of Informatics</b>																		
<b>Course Type:</b>	Required core																		
<b>Prerequisites:</b>	INFO I101 and MATH M118																		
<b>Credits:</b>	4																		
<b>Text Book:</b>	Discrete Mathematics and its Applications																		
<b>References:</b>	Handouts																		
<b>Current Catalog Description:</b>	An introduction to methods of analytical, abstract, and critical thinking; deductive reasoning; and logical and mathematical tools used in information sciences. The topics include propositional and predicate logic, natural deduction proof system, sets, functions and relations, proof methods in mathematics, mathematical induction, and graph theory.																		
<b>Course Goals</b>	The student who completes this course will be proficient in: <ul style="list-style-type: none"> <li>• the use of mathematical tools that will allow them to acquire important skills for analytical, critical and abstract thinking, as well as for understanding and making valid arguments.</li> </ul>																		
<b>Major Topics Covered in the Course</b>	<ul style="list-style-type: none"> <li>• Sets; set operations; functions; relations, sequences and summations</li> <li>• Propositional logic; propositional equivalences; predicate logic; rules of inference; counterexamples and deductive proof techniques</li> <li>• Mathematical induction; recursive definitions; recursive algorithms; program correctness</li> <li>• Information Theory</li> <li>• Algorithms; the growth of functions; complexity of algorithms</li> <li>• Graph theory, Euler and Hamilton paths</li> </ul>																		
<b>Laboratory projects (specify number of weeks on each)</b>	No closed laboratory.																		
<b>Estimate Curriculum Category Content (Semester hours)</b>	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Area</th> <th>Core</th> <th>Advanced</th> </tr> </thead> <tbody> <tr> <td>Algorithms</td> <td>0</td> <td>0</td> </tr> <tr> <td>Software Design</td> <td>0</td> <td>0</td> </tr> <tr> <td>Comp. Arch.</td> <td>0</td> <td>0</td> </tr> <tr> <td>Data Structures</td> <td>0</td> <td>0</td> </tr> <tr> <td>Prog. Languages</td> <td>0</td> <td>0</td> </tr> </tbody> </table> <p>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 interpersonal relationships and working within groups.</p>	Area	Core	Advanced	Algorithms	0	0	Software Design	0	0	Comp. Arch.	0	0	Data Structures	0	0	Prog. Languages	0	0
Area	Core	Advanced																	
Algorithms	0	0																	
Software Design	0	0																	
Comp. Arch.	0	0																	
Data Structures	0	0																	
Prog. Languages	0	0																	
<b>Oral and Written</b>	Not a course objective.																		

<b>Communications</b>	
<b>Social and Ethical Issues</b>	Not a course objective.
<b>Theoretical Content</b>	Primarily a theoretical course.
<b>Problem Analysis</b>	Many problems to check understanding of mathematical concepts presented.
<b>Solution Design</b>	Not a course objective.
<b>Prepared By</b>	Scheessele, Knight