

Course #:	CSCI-C 251																	
Course Title:	Foundations of Digital Computing																	
Course Type:	Required core																	
Prerequisites:	C243 Data Structures and a course in calculus.																	
Credits:	3																	
Text Book:	Mathematical Structures for Computer Science A Modern Approach to Discrete Mathematics, 6 th edition Judith L. Gersting																	
References:	Handouts																	
Current Catalog Description:	Mathematical foundations of computing, including mathematical induction, propositional logic, proofs of correctness. Turing machines, computability, and the halting problem.																	
Course Goals	<p>The student who completes this course will be proficient in:</p> <ol style="list-style-type: none"> 1. Propositional logic; WFFs. 2. Elementary predicate logic. 3. Methods of proof; direct; contraposition; contradiction. 4. Mathematical Induction (Weak and Strong). 5. Loop invariants and program verification proofs. 6. Sets; relations; functions. 7. Finite State Machines. 8. Turing Machines. 9. Computability/Uncomputability 																	
Major Topics Covered in the Course	<ol style="list-style-type: none"> 1. Propositional logic; WFFs. 2. Elementary predicate logic. 3. Methods of proof; direct; contraposition; contradiction. 4. Mathematical Induction (Weak and Strong). 5. Loop invariants and program verification proofs. 6. Sets; relations; functions. 7. Finite State Machines. 8. Turing Machines. 9. Computability/Uncomputability 																	
Laboratory projects (specify number of weeks on each)	No closed laboratory.																	
Estimate Curriculum Category Content (Semester hours)	<table border="1"> <thead> <tr> <th>Area</th> <th>Core</th> <th>Advanced</th> </tr> </thead> <tbody> <tr> <td>Algorithms</td> <td>55</td> <td>5</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>10</td> <td>0</td> </tr> </tbody> </table>			Area	Core	Advanced	Algorithms	55	5	Software Design	0	0	Comp. Arch.	0	0	Data Structures	10	0
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Software Design	0	0																
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	<table border="1"> <tr> <td>Prog. Languages</td> <td>0</td> <td>0</td> </tr> </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 inter personal relationships and working within groups.</p>	Prog. Languages	0	0
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Oral and Written Communications	Not a course objective.			
Social and Ethical Issues	Not a course objective.			
Theoretical Content	Primarily a Theoretical course.			
Problem Analysis	Many problems to check understanding of mathematical concepts presented.			
Solution Design	Not a course objective.			
Prepared By	Scheessele			