

University of Puerto Rico
 Mayagüez Campus
 College of Engineering
 Department of Electrical and Computer Engineering
 Bachelor of Science in Computer Engineering

Course Syllabus

1. General Information:	
Alpha-numeric codification: ICOM 4075 Course Title: Fundamentals of Computing Number of credits: 3 Contact Period: 3 hours of lecture per week Required in ICOM	
2. Course Description:	
English: Discrete structures in computer sciences and engineering with emphasis on problem-solving skills and algorithms. Topics include: set theory, logic and proof techniques, graph theory, computability, and discrete probability applied to computing problems.	
Spanish: Estructuras discretas en ciencia de computación e ingeniería con énfasis en destrezas de solución de problemas y algoritmos. Los temas incluyen: teoría de conjuntos, lógica y técnicas de demostración, teoría de grafos, computabilidad y probabilidad discreta aplicada a problemas de computación	
3. Pre/Co-requisites and other requirements:	
Pre-requisite: INGE 3016	
4. Course Objectives:	
Students will learn the fundamental mathematical and logical concepts and algorithms used in the modeling and analysis of computing systems.	
5. Instructional Strategies:	
<input checked="" type="checkbox"/> conference <input type="checkbox"/> discussion <input type="checkbox"/> computation <input type="checkbox"/> laboratory <input type="checkbox"/> seminar with formal presentation <input type="checkbox"/> seminar without formal presentation <input type="checkbox"/> workshop <input type="checkbox"/> art workshop <input type="checkbox"/> practice <input type="checkbox"/> trip <input type="checkbox"/> thesis <input type="checkbox"/> special problems <input type="checkbox"/> tutoring <input type="checkbox"/> research <input type="checkbox"/> other, please specify:	
6. Minimum or Required Resources Available:	
Students will use Departmental facilities to complete course homeworks.	
7. Course time frame and thematic outline	
Outline	Contact Hours
Logical staments	2
Proof techniques	4
Sets and set operations	2
Ordered structures: tuples and lists,	4
Counting formulas and techniques	3
Graphs and trees	4
Relations and functions	4
Equivalence relations	2
Order relations	2
Topological sorting and well-founded orders	3
Inductively defined sets	2
Recursive functions	3
Proofs by induction	4
Discrete probability	3
Tests	3

Total hours: (equivalent to contact period)	45
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8. Grading System

Quantifiable (letters) Not Quantifiable

9. Evaluation Strategies (Suggested): The faculty member teaching the course will provide the student with the evaluation strategy he/she will be using throughout the semester. This will be done within the first week of classes.

	Quantity	Percent
<input checked="" type="checkbox"/> Exams	3	65%
<input checked="" type="checkbox"/> Final Exam	1	25%
<input checked="" type="checkbox"/> Short Quizzes	variable	10%
Oral Reports		
<input type="checkbox"/> Monographies		
<input type="checkbox"/> Portfolio		
Projects		
<input type="checkbox"/> Journals		
<input type="checkbox"/> Other, specify:		
TOTAL:		100%

10. Bibliography:

J. L. Hein, Discrete Structures, Logic, and Computability. Jones and Barlett, Second Edition (2002).

Kenneth H. Rosen, *Discrete Mathematics and Its Applications: And Its Applications* , 6th Ed., McGraw-Hill, 2006.

Susanna S. Epp, *Discrete Mathematics with Applications* , 3rd Ed. , Bruce Cole, 2003.

11. According to Law 51

Students will identify themselves with the Institution and the instructor of the course for purposes of assessment (exams) accommodations. For more information please call the Student with Disabilities Office which is part of the Dean of Students office (Chemistry Building, room 019) at (787)265-3862 or (787)832-4040 extensions 3250 or 3258.

12. Contribution of Course to meeting the requirements of Criterion 5:

Math	Basic Science	General	Engineering Topic
√			√

13. Course Outcomes

Map to Program Outcomes

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|---|-----|
| 1. Understating of models based on discrete mathematics. | (a) |
| 2. Ability to design and analyze basic mathematical models for computing problems using discrete mathematics. | (a) |
| 3. Ability to design and analyze mathematical proofs for computing problems. | (a) |

Person (s) who prepared this description and date of preparation: Jaime Seguel. Submitted by: Manuel Rodríguez, Jun 07