

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 4035 Course Title: Data Structures Number of credits: 4 Contact Period: 3 hours of lecture and 2 hours of laboratory per week Required in ICOM	
2. Course Description:	
English: Data structures in programming languages; representation of information as data; lists in linear, orthogonal, string, and array form; tree structures; techniques for storage allocation, distribution, collection, and sorting of data.	
Spanish: Estructuras de datos en lenguajes de programación; representación de información en forma de datos; listas de forma lineal, ortogonal, en sucesión y en arreglo; estructuras tipo árbol; técnicas para el almacenamiento, la distribución, la recolección y el	
3. Pre/Co-requisites and other requirements:	
Pre-requisite: ICOM 4015 and MATE 3031	
4. Course Objectives:	
Students will learn how to implement fundamental data structures such as linked lists, hash tables, and trees. Using this knowledge, students will write programs whose major components are built using the data structures previously implemented.	
5. Instructional Strategies:	
<input checked="" type="checkbox"/> conference <input type="checkbox"/> discussion <input checked="" type="checkbox"/> computation <input checked="" 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 the Departmental computer laboratories to complete course projects.	
7. Course time frame and thematic outline	
Outline	Contact Hours
Review of arrays, pointers, classes, inheritance and templates	3
Container classes: Vector, Bag, and Set	3
Discrete Mathematics: Induction and Basic Set Theory	2
Computational Complexity	3
Linked Lists	3
Stacks	2
Queues	2
Trees	5
Binary Search Trees	3
AVL-trees	2
B-trees	2
Maps and Hash Tables	3
Heaps and Priority Queues	3
Graphs and their implementation	2

Graph Traversal Algorithms	2
Sorting	2
Exams	3
Total hours: (equivalent to contact period)	45

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	45%
<input checked="" type="checkbox"/> Final Exam	1	25%
<input type="checkbox"/> Short Quizzes		
<input type="checkbox"/> Oral Reports		
<input type="checkbox"/> Monographies		
<input type="checkbox"/> Portfolio		
<input checked="" type="checkbox"/> Projects	variable	30%
<input type="checkbox"/> Journals		
<input type="checkbox"/> Other, specify:		
TOTAL:		100%

10. Bibliography:

Michael T. Goodrich, Roberto Tamassia, “Data Structures and Algorithms in Java”, (4th Edition) John Wiley and Sons, 2005.

Frank M. Carrano, “Data Structures and Abstractions with Java”, 2nd Ed, Addison-Wesley, 2006.

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
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13. Course Outcomes

- Analyze techniques for data structure usage in computer applications.
- Apply techniques for data structure usage in computer applications.
- Analyze the behavior of different data structures.
- Design different data structures,
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Map to Program Outcomes

- (a)
- (c)
- (a)
- (c)

Person (s) who prepared this description and date of preparation: Manuel Rodríguez. Submitted by: Manuel Rodríguez, March 2007