CIIC 4010 - Course Syllabus

1. **General Information:**

   Alpha-numeric codification: CIIC 4010
   Course Title: Advanced Programming
   Number of credits: 4
   Contact Period: 3 hours of lecture and 2 hours of laboratory per week

   Equivalent Course: ICOM 4015

2. **Course Description:**

   English: Advanced programming techniques applied to the solution of engineering problems; extensive use of subprograms, logical and specifications statements. Principles of multiprogramming, multiprocessing, and real-time systems.

   Spanish: **Spanish**: Técnicas avanzadas de programación aplicadas a la solución de problemas de ingeniería; uso extensivo de subprogramas, expresiones lógicas y de especificación. Principios de multiprogramación, multiprocesamiento y sistemas "real-time".

3. **Pre/Co-requisites and other requirements:**

   Prerequisites: CIIC 3015 or CIIC 3011 or INGE 3016

4. **Course Objectives:**

   The student will learn how to use sub-routines, arrays, classes, and other object-oriented techniques for the design, implementation and analysis of complex software systems used in Computer Science, Computer Engineering and Software Engineering.

5. **Instructional Strategies:**

   ☒conference ☐discussion ☒computation ☒laboratory

   ☐seminar with formal presentation ☐seminar without formal presentation ☐workshop

   ☐art workshop ☐practice ☐trip ☐thesis ☐special problems ☐tutoring

   ☐research ☐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
Introduction to Computing	2.5
Fundamental Data Types, Operations, Expressions, and I/O	2.5
Decisions	1.5
Iteration	1.5
Functions	3
Arrays	3
Introduction to ADTs	3
Object-Oriented Concepts	4
Object Oriented Design	4
Input/Output and File Management	3
Recursive Algorithms	3
Sorting Algorithms	4
Searching Algorithms	3
Introduction to the Analysis of Algorithms	4
Exams and discussions	3
Laboratory Sessions	30
Total hours: (equivalent to contact period)	75

8. **Grading System**

   ☒ Quantifiable (letters) ☐ Not Quantifiable

9. **Evaluation Strategies**

	Quantity	Percent
☒ Exams	3	35%
☒ Final Exam	1	30%
☒ Short Quizzes		
☐ Oral Reports		

☐ Monographies		
☐ Portfolio		
☒ Projects	4	25%
☐ Journals		
☒ Other, specify: Laboratory	10	10%
TOTAL:		100%

10. Bibliography:

1. Cay Horstmann, *Java Concepts*, 7th ed., John Wiley, 2012.
2. Walter Savitch and Kenrick Mock, *Absolute Java*, 5th ed.*,* Addison-Wesley, 2012.
3. Paul Deitel, and Harvey Deitel, *Java How to Program,* 9th Ed., Prentice Hall, 2011.
4. Herbert Schildt, *Java - A Beginner's Guide*, 5th Ed., McGraw Hill, 2011.

11. Course Outcomes

Upon completion of this course the student will be able to:	Program Outcomes
1. discuss contemporary issues in the discipline of Computer Science and Engineering	C4, E4
2. apply fundamental process control structures in programming languages, including sequence, selection, and repetition.	C6
3. develop procedural and object oriented programming solutions to problems.	C1, E1
4. use modern software development tools and techniques to design, implement, and test software applications.	C2, E2
5. work in a team and use modern collaboration tools to develop a software application	C5, E5

12. 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 (Office #4) at (787)265-3862 or (787)832-4040 extensions 3250 or 3258.

13. Academic Integrity

-The University of Puerto Rico promotes the highest standards of academic and scientific integrity. Article 6.2 of the UPR Students General Bylaws (Board of Trustees Certification 13, 2009-2010) states that academic dishonesty includes, but is not limited to: fraudulent actions; obtaining grades or academic

degrees by false or fraudulent simulations; copying the whole or part of the academic work of another person; plagiarizing totally or partially the work of another person; copying all or part of another person answers to the questions of an oral or written exam by taking or getting someone else to take the exam on his/her behalf; as well as enabling and facilitating another person to perform the aforementioned behavior. Any of these behaviors will be subject to disciplinary action in accordance with the disciplinary procedure laid down in the UPR Students General Bylaws.—