

## THE AMERICAN UNIVERSITY OF PARIS – Undergraduate syllabus

<b><u>COURSE TITLE:</u></b>	<b>Introduction to Computer Programming</b>	<b><u>COURSE NO:</u></b>	CS 1040
<b><u>PREREQUISITES:</u></b>	none	<b><u>SEMESTER:</u></b>	Spring 2012
<b><u>PROFESSOR:</u></b>	Claudia Roda - <a href="http://ac.aup.fr/roda/">http://ac.aup.fr/roda/</a>	<b><u>CREDITS:</u></b>	5
<b><u>CLASS SCHEDULE:</u></b>	Monday 9h00 to 10h20 and 10h35 to 11h45 Thursday 10h35 to 11h45	<b><u>ROOM NO:</u></b>	G4
<b><u>OFFICE HOURS:</u></b>	By appointment: <a href="mailto:croda@aup.fr">croda@aup.fr</a> or mailbox at Grenelle.	<b><u>PERIOD (S):</u></b>	Mon 1+2, Thu 2
<b><u>OFFICE NUMBER:</u></b>	Office:G45		
<b><u>OFFICE TEL EXT:</u></b>	extension 701		
<b><u>MAILBOX</u></b>	Grenelle		
<b><u>LOCATION:</u></b>			

---

**COURSE DESCRIPTION:** Introduces the field of Computer Science and the fundamental concepts of programming from an object-oriented perspective using the programming language Java. Starts with practical problem solving and leads to the study and analysis of simple algorithms, data types, control structures, and use of simple data structures (arrays, strings, vectors, etc.). The course emphasizes good software engineering principles and developing fundamental programming skills. The pedagogical methodology emphasizes experiential learning by asking students to solve real problems from the start. Analyzing and representing problems, as well as finding the information necessary to arrive to their solutions are the recurring themes of this course. There will be a considerable amount of practical work; students should allow at least eight hours of home work per week for this. All classes will take place in the Computer Laboratory so that it will be possible to experiment and build-on all the theories and algorithms introduced. For a more detailed description of the course please refer to the course Web site: <http://ac.aup.fr/roda/cs140>. Note that content schedule, assignments, readings, etc. are updated online during the semester therefore you should make sure you check the course site regularly.

**STUDENT LEARNING GOALS:** Students will learn about *computing* and *object oriented methodologies*. They will learn and experience *algorithm design* as well as implementing algorithms using *Object Oriented Programming*. Several essential aspects of the Java language will be introduced: classes/objects, methods, types and expression, control structures, and collections. Students will be expected to learn how to use the appropriate (natural) language to refer to OO design and programming concepts. Essential properties of OO will be introduced including: encapsulation, data hiding, data abstraction, and message passing.

**Measurable Outcomes:** Upon completing this course students should be able to:

- Identify possible design solutions to simple problems (typically including 2 to 4 students' defined classes, each containing several methods and variables)
- Describe, in English, the characteristics of a possible object oriented design solution to a simple problem (e.g. "I will need to define two classes. The first class will contain three instance variables, and one class variable, ...")
- Implement Java programs for designs they have created or have been given.
- Understand and use data abstraction, encapsulation, and message passing. Note that although the concepts of polymorphism and interfaces will have been introduced, students will not be expected, at the end of this course, to have a full grasp on their implications and use.
- Use comments efficiently. Appreciate the importance of appropriate naming.
- Understand the basics of using APIs
- Read and understand programs that may make use of libraries that have not been studied before (within a reasonable choice)
- Understand the use of Java syntax and semantics and being able to find out information they are missing (e.g. using the online Java API)
- Fully understand the differences between primitive types and reference types (this includes concepts such as shallow copying and practical issues such as parameter passing in the two cases).
- Use variables and constants, understand their scope, visibility, and accessibility.
- Use basic Java operators. Understand precedence rules, arity, and general composition of Java expressions.
- Create and use instance and class methods, passing parameters, and returning values. The message passing metaphor, methods' signatures, and overloading. Understand the role and be able to build different type of methods such as constructors, getters, setters, and modifiers. Understand the use of the *this* construct.
- Understand control-flow and use selection and repetition constructs.
- Simple I/O.
- Demonstrate understanding of the role and issues related to the creation of testing units. As well as being able to create meaningful testing units for small programs.
- Use simple collections such as Strings, Arrays, ArrayList, and Vector. Understand their different properties and being able to select the appropriate structure for a given problem.
- Develop a good experience with at least one IDE for Java.

**GENERAL EDUCATION:** The general education program at AUP consists of four requirements: Speaking the World, Modeling the World, Mapping the World, and Comparing Worlds Past and Present. This course can be used to fulfill the Mapping the World requirement and as such has the following learning objectives:

- Introduce and practice algorithmic reasoning
- Provide a clear understanding of how programming languages relate to natural languages
- Enable students to generate formal description of worlds properties and interactions

### **TEXTBOOKS:**

**REQUIRED: Java Software Solutions, Lewis & Loftus (6<sup>th</sup> edition) Pearson – Addison Wesley**

All material covered in class is available in the course web site: <http://ac.aup.fr/roda/cs140>

**ATTENDANCE:** Because the course is based on hands-on experience, students are expected to attend all lectures and participate in class.

**HOMEWORK ASSIGNMENTS:** The homework assignments will each be designed to develop and test skills and knowledge related to the immediately preceding classes. Their main purpose is to help students to develop problem solving skills and assess their own strengths and weaknesses. Solutions to homework assignments will be discussed in class.

**GRADING:** The grading scheme is as follows:

Class tests	45%
Class participation	10%
Final Examination	45%

Typically a grade of A will be above 90% and F below 50%.

### **ATTENDANCE POLICY:**

Students studying at The American University of Paris are expected to attend ALL scheduled classes, and in case of absence, should contact their professors to explain the situation. It is the student's responsibility to be aware of any specific attendance policy that a faculty member might have set in the course syllabus. The French Department, for example, has its own attendance policy, and students are responsible for compliance. Academic Affairs will excuse an absence for students' participation in study trips related to their courses.

**Attendance at all exams is mandatory.**

IN ALL CASES OF MISSED COURSE MEETINGS, THE RESPONSIBILITY FOR COMMUNICATION WITH THE PROFESSOR, AND FOR ARRANGING TO MAKE UP MISSED WORK, RESTS SOLELY WITH THE STUDENT.

Whether an absence is excused or not is ALWAYS up to the discretion of the professor or the department. Unexcused absences can result in a low or failing participation grade. In the case of excessive absences, it is up to the professor or the department to decide if the student will receive an "F" for the course. An instructor may recommend that a student withdraw, if absences have made it impossible to continue in the course at a satisfactory level.

Students must be mindful of this policy when making their travel arrangements, and *especially during the Drop/Add and Exam Periods.*

**ENGLISH LANGUAGE PROFICIENCY STATEMENT:** As an Anglophone university, The American University of Paris is strongly committed to effective English language mastery at the undergraduate level. Most courses require scholarly research and formal written and oral presentations in English, and AUP students are expected to strive to achieve excellence in these domains as part of their course work. To that end, professors include English proficiency among the criteria in student evaluation, often referring students to the university Writing Lab where they may obtain help on specific academic assignments. Proficiency in English is monitored at various points throughout the student's academic career, most notably during the admissions and advising processes, while the student is completing general education requirements, and during the accomplishment of degree program courses and senior theses.

**OUTLINE:** see course web site: <http://ac.aup.fr/roda/cs140>