

Course Competencies Template - Form 112

GENERAL INFORMATION			
Name: Greg Ballinger	Phone #: 305-237-2879		
Course Prefix/Number: COP2800	Course Title: Java Programming		
Number of Credits: 4			
Degree Type	<input type="checkbox"/> B.S. <input type="checkbox"/> B.A.S <input checked="" type="checkbox"/> A.A. <input checked="" type="checkbox"/> A.S. <input type="checkbox"/> A.A.S. <input type="checkbox"/> C.C.C. <input type="checkbox"/> A.T.C. <input type="checkbox"/> V.C.C		
Date Submitted/Revised: 3/12/08	Effective Year/Term: 2009-1		
<input type="checkbox"/> New Course Competency <input checked="" type="checkbox"/> Revised Course Competency			
Course to be designated as a General Education course (part of the 36 hours of A.A. Gen. Ed. coursework): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
The above course links to the following Learning Outcomes: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Communication <input checked="" type="checkbox"/> Numbers / Data <input checked="" type="checkbox"/> Critical thinking <input checked="" type="checkbox"/> Information Literacy <input type="checkbox"/> Cultural / Global Perspective </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Social Responsibility <input type="checkbox"/> Ethical Issues <input checked="" type="checkbox"/> Computer / Technology Usage <input type="checkbox"/> Aesthetic / Creative Activities <input type="checkbox"/> Environmental Responsibility </td> </tr> </table>		<input type="checkbox"/> Communication <input checked="" type="checkbox"/> Numbers / Data <input checked="" type="checkbox"/> Critical thinking <input checked="" type="checkbox"/> Information Literacy <input type="checkbox"/> Cultural / Global Perspective	<input type="checkbox"/> Social Responsibility <input type="checkbox"/> Ethical Issues <input checked="" type="checkbox"/> Computer / Technology Usage <input type="checkbox"/> Aesthetic / Creative Activities <input type="checkbox"/> Environmental Responsibility
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Course Description (limit to 50 words or less, must correspond with course description on Form 102): This is an intermediate level programming course using the Java computer language, recommended for Computer Science and Computer Information Systems majors. Students will learn to code, compile and execute programs while learning advanced programming concepts and object oriented programming and design concepts and principles. Prerequisite: COP1334. Laboratory fee. (3 hr. lecture, 2hr. lab)			
Prerequisite(s): COP1334	Corequisite(s):		

Course Competencies: (for further instruction/guidelines go to: <http://www.mdc.edu/asa/curriculum.asp>)

Competency 1: The student will demonstrate an understanding of the Java system architecture and its major components by:

1. Distinguishing between the Java Runtime Environment (JRE) and the Java Development Kit (JDK).
2. Identifying the Java Virtual Machine (JVM) and the Java compiler.
3. Describing the process of coding, compiling and running from the command line.
4. Differentiating between *.java and *.class files.
5. Installing the JDK and compiling a program from the command line that uses at least one optional Java package.
6. Using the JDK standard packages and API documentation in developing their own programs.

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Competency 2: The student will demonstrate an understanding of the professional software development process by:

1. Designing and documenting solutions at the method level by writing pseudocode or developing flow charts for development before writing the code.
2. Designing and documenting solutions at the project level by using an object-oriented design technology such as UML or CRC cards.
3. Coding software solutions following professional coding style guidelines.
4. Incorporating adequate and meaningful comments into the source code of programming projects using both standard and javadoc style comments.
5. Testing and designing tests of software solutions.
6. Debugging program code.

Competency 3: Students will demonstrate an understanding of fundamental programming constructs and concepts by:

1. Using appropriate data types for programming assignments.
2. Using Boolean, comparison, arithmetic and object (instanceof) operators in their programs.
3. Explaining the properties of a variable such as its name, value, scope, persistence, and size.
4. Distinguishing between expressions and statements.
5. Identifying and using the three control structures (sequence, selection and repetition).

Competency 4: The student will demonstrate an understanding of the following advanced programming techniques by:

1. Parsing a string and using other string manipulation techniques.
2. Using both arrays and the Java collections to process aggregate data.
3. Using object composition (object references) to build more complex objects.
4. Developing an event driven program.
5. Writing a recursive algorithm for solving a problem and identifying its exit condition.

Competency 5: The student will demonstrate an understanding of the object oriented programming concepts of *Class* and *Object* by:

1. Identifying and using instance variables and instance methods.
2. Using, programming, and identifying constructors.

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3. Explaining the process of object instantiation.
4. Using, programming, and identifying accessor and mutator methods.
5. Using, programming, and identifying class (static) variables and class (static) methods.
6. Using, programming, and identifying overloaded methods and constructors.
7. Creating programs using inner classes and describing their effects on generated class files.

Competency 6: The student will demonstrate an understanding of inheritance by:

1. Explaining the benefits of inheritance.
2. Creating a class which extends a parent class.
3. Explaining the restrictions imposed when using inheritance.
4. Overriding and overloading parent class functions within a child class.
5. Distinguishing between inheritance of implementation (extends) and inheritance of design (implements).
6. Creating a class which implements an interface.
7. Creating a class which extends an abstract class.

Competency 7: The student will demonstrate an understanding of Object Oriented Design concepts by:

1. Using visibility modifiers (public, private, protected) to implement appropriate abstraction and encapsulation.
2. Explaining coupling and how to achieve loose coupling.
3. Explaining cohesion and how to achieve high cohesion.
4. Writing a program which demonstrates polymorphism.

Competency 8: The student will demonstrate an understanding of Java input and output by:

1. Describing I/O.
2. Creating programs that use console I/O.
3. Creating programs that use GUI (dialog box) I/O.
4. Creating programs that use file I/O.

Competency 9: The student will demonstrate an understanding of exception programming techniques by:

1. Describing exceptions.
2. Encapsulating exceptions.
3. Throwing and catching exceptions.

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Competency 10: The student will demonstrate an understanding of GUI (Graphical User Interfaces) and event-driven programs by:

1. Describing the Java GUI library structure (AWT and swing).
2. Writing a GUI program using a single window and appropriate components.
3. Describing the uses of layout managers.
4. Creating programs that handle events.

Competency 11: The student will demonstrate an understanding of professional development by:

1. Participating as a member of a project team.
2. Finding and reviewing a professional source of information.

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