

**EMBRY-RIDDLE AERONAUTICAL UNIVERSITY**  
**Department of Computing and Mathematics**  
**COURSE OUTLINE FOR**

**Course No.:** SE320

**Title:** Advanced Programming Practices

**Cr Hrs:** 3

**Lecture Hours:** 3

**Laboratory Hours:** 3

**COURSE DESCRIPTION:**

This course provides the student with advanced instruction in programming with an object oriented programming language. The course objective is proficiency in use of a language widely used for general purpose software development. In addition, the student will be introduced to tools and processes appropriate for employing this language in a significant software development environment. Students attending this course must already be proficient in the use of one major programming language and have knowledge of basic software engineering practices.

Prerequisite: CS315, SE300

**GOALS:**

The primary course objective is for students to acquire advanced knowledge and experience about object-oriented programming, data structures and algorithms, graphical user interfaces, and software development processes.

**PERFORMANCE OBJECTIVES:**

Upon completion of this course, students should be able to:

1. Describe the concepts and features of object-oriented programming (OOP).
2. Design modest-sized programs using the object-oriented paradigm.
3. Use the Java programming language to implement OO designs.
4. Use features of the Java programming language for developing applications involving concurrency, the WWW, GUIs, and advanced data structures and algorithms.
5. Use a defined process to develop programs.

Note: Currently, on the Daytona Beach Campus, Java is being used in SE320. However, other object-oriented languages, such as C++ or Ada95, would also be appropriate for SE320 objectives.

**Department of Computing and Mathematics**  
**COURSE OUTLINE FOR SE320, Continued**

**TEXTBOOK:**

*Java Programming: Advanced Concepts*, Joe Wiiglesworth & Paula Lumby, Course Technology, 2000.

**SUGGESTED SUPPLEMENTAL MATERIALS:**

*Introduction to the Personal Software Process*. Watts Humphrey, Addison Wesley, 1997.

**PREREQUISITE KNOWLEDGE BY TOPIC:**

1. moderate to substantial experience programming in a high-level language.
2. basic data structures and algorithms
3. knowledge of software engineering and software development processes

TOPIC	CLASS HOURS	COURSE OBJECTIVES
Object Oriented (OO) Concepts	2	Describe the concepts and features of object-oriented programming (OOP).
OO Language Fundamentals	6	Apply knowledge of the syntax and semantics of an OO language to do the following: implement object classes, create instances of the classes, send messages between objects, and write programs that use an "object-oriented" paradigm to solve problems.
Objects and Classes	8	Apply knowledge of information hiding, inheritance, and polymorphism to design and implement object classes.
Concurrency	3	Describe the key concepts and areas of application of concurrent processing. Design and implement a multithreaded programs.
Graphical User Interfaces	9	Describe the common graphical components used in GUI design and how they are realized in a programming language. Design and implement an application using GUI input and output.
Advanced Data Structures and Algorithms	6	Gain additional experience in designing, analyzing, and implementing data structures and algorithms
Software Engineering Practices	6	Apply good software engineering practices in the design and writing of OO programs.

**LABORATORY:**

An open computer laboratory for individual project work.

**COMPUTER USAGE:**

software development tools (editor, linker, compiler, debugger, OOA/OOD tools, ), spreadsheet, word processor, web browser

**GRADING SYSTEM:**

Quizzes, Programming Assignments	50%
Mid-Term Exam	25%
Final Exam	25%

**ESTIMATED CONTENT:**

<b>Skills:</b>	<b>50 %</b>
<b>Content:</b>	<b>50 %</b>