HAWAII PACIFIC UNIVERSITY

Computer Science II
CSCI 2912 CRN1262
COURSE SYLLABUS
MILITARY TERM 3 - 06 – Saturdays 0800 – 1210
Section A (Schofield) - Building and Room Number assignments will be posted by HPU in prominent places on campus prior to class start date

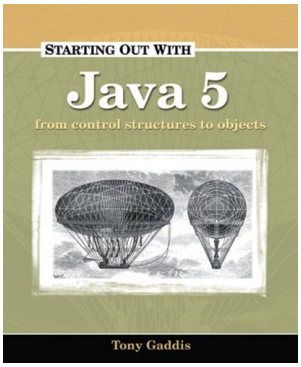
Instructor: Mr. George McOuat **Phone:** Home (808) 262-1314 (0900 - 2000hrs) **E-mail:** gmcouat@hpu.edu

Mr. McOuat received his Bachelor's degree in General Studies from Chaminade University of Honolulu, Hawaii and his Master's degree in Systems Management from the University of Southern California. He spent over 20 years in the telecommunications industry before beginning teaching at Hawaii Pacific University in 1995.

Course Web Site: In all cases, the class information published on the Course Web Site, http://www.GeorgeMcOuat.com, supercedes this syllabus. This syllabus is provided at the beginning of the class to act as an initial guideline and agenda for the class.

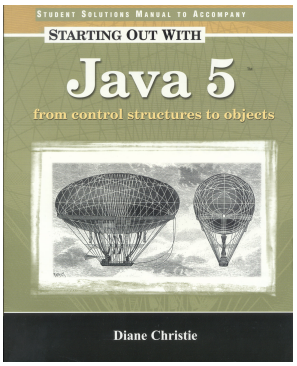
Prerequisites: CSCI 2911 and MATH 1130; or their equivalents.

Course Text (Required):



Starting Out With Java 5 from Control Stuctures to Objects, by Tony Gaddis; Scott Jones; *ISBN: 1-57676-171-1*

Course Text (Optional):



Student Solutions Manual to Accompany Starting Out With Java 5: From Control Structures to Objects, Diane Christie, Scott Jones, 2005; *ISBN: 1-57676-175-4*

Course Software (Required): *Java 2 Platform Standard Edition Development Kit 5.0* This software accompanies the book on a CD-ROM. Those not wishing to use this software for their home computer may complete all assignments in one of the Hawaii Pacific University Computer Labs. Students are encouraged to visit the HPU website and Pipeline (http://www.HPU.edu) regularly to insure they are kept up to date on university happenings, policies, etc. Of particular interest is the Military Campus Programs tab. Students experiencing difficulty in accessing any HPU Pipeline reference or executing presentation links on the instructor's website are requested to call the HPU Computer Help Desk number at 566-2411.

Course Description: An intermediate problem-solving and programming course covering composite data structures, abstract data typing, algorithmic analysis, and modular programming techniques. Structured and object-oriented programming methods are reinforced through extensive programming assignments.

HAWAII PACIFIC UNIVERSITY

Computer Science II
CSCI 2912 CRN1262
COURSE SYLLABUS
MILITARY TERM 3 - 06 – Saturdays 0800 – 1210
Section A (Schofield) - Building and Room Number assignments will be posted by HPU in prominent places on campus prior to class start date

Course Learning Objectives: Upon successful completion of this course, students will be able to:
1. Apply a variety of classical principles and techniques for solving computer-related problems.
2. Design and implement well-structured algorithms and user-friendly interfaces.
3. Decompose problems into separate well-defined components with appropriate linkages.
4. Utilize all the basic data types of procedural languages.
5. Understand the concepts of abstract data types and objects.
6. Thoroughly test and document computer programs.

Specifically:

Fundamental Data Structures
1. Discuss the representation and use of primitive data types and built-in data structures.
2. Describe how data structures are allocated and used in memory.
3. Describe common applications for each data structure.
4. Implement user-defined data structures in a high-level language.
5. Compare alternative implementations of data structures with respect to performance.
6. Write programs that use each of the following data structures: arrays, records, strings, linked lists, stacks, queues, and hash tables.
7. Compare and contrast the costs and benefits of dynamic and static data structure implementations.
8. Choose the appropriate data structure for modeling a given problem.

Recursion
1. Describe the concept of recursion and give examples of its use.
2. Identify the base case and the general case of a recursively defined problem.
3. Compare iterative and recursive solutions for elementary problems such as factorial.
4. Describe the divide-and-conquer approach.
5. Implement, test, and debug simple recursive functions and procedures.
6. Describe how recursion can be implemented using a stack.
7. Discuss problems for which backtracking is an appropriate solution.
8. Determine when a recursive solution is appropriate for a problem.

Event-Driven Programming
1. Explain the difference between event-driven programming and command-line programming.
2. Design, code, test, and debug simple event-driven programs that respond to user events.
3. Develop code that responds to exception conditions raised during execution.

Fundamental Computing Algorithms
1. Implement the most common quadratic and O(N log N) sorting algorithms.
2. Design and implement an appropriate hashing function for an application.
3. Design and implement a collision-resolution algorithm for a hash table.
4. Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.
5. Discuss factors other than computational efficiency that influence the choice of algorithms, such as programming time, maintainability, and the use of application specific patterns in the input data.
6. Solve problems using the fundamental graph algorithms, including depth-first and breadth-first search, single-source and all-pairs shortest paths, transitive closure, topological sort, and at least one minimum spanning tree algorithm.
7. Demonstrate the following capabilities: to evaluate algorithms, to select from a range of possible options, to provide justification for that selection, and to implement the algorithm in programming context.

Declarations And Types
1. Explain the value of declaration models, especially with respect to programming-in-the-large.
2. Identify and describe the properties of a variable such as its associated address, value, scope, persistence, and size.
3. Discuss type incompatibility.
4. Demonstrate different forms of binding, visibility, scoping, and lifetime management.
5. Defend the importance of types and type-checking in providing abstraction and safety.

6. Evaluate tradeoffs in lifetime management (reference counting vs. garbage collection).

Abstraction Mechanisms

1. Explain how abstraction mechanisms support the creation of reusable software components.
2. Demonstrate the difference between call-by-value and call-by-reference parameter passing.
3. Defend the importance of abstractions, especially with respect to programming-in-the-large.
4. Describe how the computer system uses activation records to manage program modules and their data.

Object Orientated Programming

1. Justify the philosophy of object oriented design and concepts of encapsulation, abstraction, inheritance, and polymorphism.
2. Design, implement, test, and debug simple programs in an object-oriented programming language.
3. Describe how the class mechanism supports encapsulation and information hiding
4. Design, implement, and test the implementation of an "is-a" relation among objects using a class hierarchy and inheritance.
5. Compare and contrast the notions of overloading and overriding methods in an object-oriented language.
6. Explain the relationship between static structure of the class and the dynamic structure of the instances of the class.
7. Describe how iterators access elements of a container.

Five Themes: The Five Themes of the General Education Core includes World Cultures, Values and Choices, Global Systems, Research and Epistemology (The branch of philosophy that studies the nature of knowledge, its presuppositions and foundations, and its extent and validity), and Communication. Every course offering should enhance the student's knowledge in one or more of the five themes. This course will improve the student's grasp of communication as conversion of word problems as an integral part of problem solving is taught. Communication skills will be practiced and enhanced by satisfactory participation in the class discussions during the semester. Global Systems and World Cultures will not be able to be emphasized in the conduct of this class. Values and Choices will be demonstrated and practiced through your interactions with other class members and your choices about academic honesty during the class. Research and Epistemology will be practiced through investigation of new concepts in this class by further research using libraries, supporting web sites and other Internet resources.

Report Writing Format: The APA format will be used for any required reports.

Instructor's Expectations of Student Performance: The instructor's expectations are based upon the premise that learning is most effective and meaningful when students actively participate in the process.

Students will be expected to complete regular readings and homework assignments. Student's mastery of course material will be measured by completion of the programming assignments assigned during the semester. If you cannot get the correct result for a programming problem, submit everything you know about the problem and how to obtain the solution. I will require that you get a correct program for every assigned problem before you get any credit for the problem. I will be glad to work with you as necessary to help you get the solution, but I will not think for you. If you work with anyone else except the instructor in the development of your solutions to homework assignments place a comment in the source code stating the name of the individual(s) and the extent of the help provided.

Instructor's Classroom Expectations: Students are expected to attend all class meetings, be on time for all class meetings, actively participate in all class activities, and demonstrate professional behavior at all times within the classroom.

Attendance/Lateness Policy: If a student misses a class, it will be the responsibility of the student to obtain class notes, do the assigned work, and provide timely submissions of said work. If a student must miss a class due to work, personal problems, or a job interview, they are advised to notify the instructor ahead of time. If a quiz, test, or examination is given and a student is absent from class AND has not previously notified the instructor of the reason for their absence, a grade of zero will be assigned for the missed deliverable. Assignments submitted later than the due date may be assessed a penalty at the discretion of the instructor.

HAWAII PACIFIC UNIVERSITY

Computer Science II
CSCI 2912 CRN1262
COURSE SYLLABUS
MILITARY TERM 3 - 06 – Saturdays 0800 – 1210
Section A (Schofield) - Building and Room Number assignments will be posted by HPU in prominent places on campus prior to class start date

Grading:

Quizzes on Reading Assignments	15%
Programming Projects	55%
Midterm Examination	15%
Final Examination	15%

Normalization: Each assignment and quiz will be graded and a value between 0-10 assigned. Exams will have a value between 1 and 100 assigned. The cumulative average of any one group of assignments, quizzes and exams will then be expressed as a fraction of the total percentage allocated to that category. For instance: Each quiz, some ranging from as many as 50 questions to as few as 20 questions has the same weight. On a 50 question quiz, getting 40 right results in a score of 8. On a 20 question quiz, getting 19 right results in a score of 9.5. Four quizzes total 40 points. 15% is the value toward the final grade given for quizzes. If you were to have a cumulative total of 30 points for quizzes, your percentage toward the grade of 100 would be 10.0. Each category is then added to the total resulting in a letter grade per the below standard. Straight letter grades are given for this course. There are no plusses or minuses. The standard percentage breakdown is below.

Standard:	A	90	-	100
	B	80	-	89
	C	70	-	79
	D	60	-	69
	F	59 and Below		

Incomplete Courses (Grades Of I): Incomplete grades are reserved for cases of illnesses and other emergencies that cause a student to be unable to complete the course by the due date. In such cases, the instructor has the option of issuing an "incomplete" grade at the end of the semester. If granted, the "incomplete" grade will allow a student a maximum period of six months to complete the appropriate course work. If the student does not complete the assignments and the instructor does not submit a grade to the Registrar's Office after the six-month period, a grade of "F" will be assigned.

Withdrawal From Course: Withdrawal is permitted without penalty to student GPA before May 12, 2006. Students withdrawing during that time will receive a "W" grade. On Monday, May 15, 2006, the sixth week of the course begins. Students withdrawing after the sixth week begins will receive a grade commensurate with the level of achievement they have shown to that point.

Academic Dishonesty Policy: The policy of Hawaii Pacific University is clear regarding academic dishonesty. Any student who cheats on an academic exercise, lends assistance to others without express permission from the instructor, or who hands in work that is not his or her own will be penalized. The ultimate penalty is expulsion from the University. The term "academic exercise" includes all forms of work submitted for points, grades, or credit. Ignorance of this policy is no excuse for any academic dishonesty. Each student is responsible for ensuring that work submitted in his or her name is an original effort. Any assistance that is received from anyone other than the instructor must be documented in the source code for the problem. Furthermore, each student is responsible for ensuring that their work is not made available to others for study or duplication. All rules and policies concerning academic misconduct as defined by the HPU Academic Misconduct Policies and Procedure will be strictly enforced. This policy is required in order for me to make sure that each student understands the course material and is not simply relying on other students' knowledge to get the solutions to programming problems. The complete policy document is attached to this syllabus.

HAWAII PACIFIC UNIVERSITY

Computer Science II
CSCI 2912 CRN1262
COURSE SYLLABUS
MILITARY TERM 3 - 06 – Saturdays 0800 – 1210
Section A (Schofield) - Building and Room Number assignments will be posted by HPU in prominent places on campus prior to class start date

COURSE SCHEDULE – Revision 1 (04/08/2006)

Any Subsequent Revisions will be Bold and Red

Week #	*Week*	*Topic*	*Reading Assignment*	*Assignment Due*
1	04/08/06	• Syllabus Review • Java Software Installation • JCreator Software Installation • Appendix D on Student CD-ROM • Review: Arrays & ArrayList Class: Single and Multi-dimensional arrays. Highest, lowest values, linear search, binary search, selection sort. Parallel and ragged array processing. • Review: Enhanced for loop, ArrayList class, Java 5's generic types.	**Chapter 8,** Pages 457 – 546	Homework Assignment (DUE IMMMEDIATELY): Email the instructor (gmcouat@hpu.edu) with your name, course, section, main and secondary email addresses and home phone number (worth one assignment) Note: Your Semester, Term, Course, Section and CRN as below **MUST** appear first in the subject line of **ALL** emails sent to the instructor (2006-03 CSCI 2912 A 1262). Exercises listed below are due by email on the Saturday of the week they appear! You must check to see when an exercise is due to insure that you are not caught unaware. i.e. You should be working on Exercise_08_05 THIS WEEK! It is due by Saturday April 15, 2006 (next week!)

2	04/15/06	• More Classes: Static Methods and fields. Interaction between Objects, passing objects as arguments, returning objects from methods. Aggregation and "has-a" relationship. • Enumerated types.	**Chapter 9**, Pages 547 – 613	Quiz on Chapter 8 For All Exercises, Be Sure To Follow The *Java Project Submission Requirements* (can be accessed on the instuctor's web site on the class page) **Exercise _08_05: page 543.**
3	04/22/06	• Text Processing and Wrapper Classes: numeric and Character wrapper classes, converting numbers to strings, testing case, converting case. • String manipulation and searching.	**Chapter 10**, Pages 615 – 672	Quiz on Chapter 9 **Exercise _09_08: page 609.**
4	04/29/06	• Recursion: Recursion as a problem solving technique.	**Chapter 15**, Pages 957 – 985	Quiz on Chapter 10 **Exercise _10_5: page 669.**
5	05/06/06	**Midterm Exam**		
6	05/13/06	• Inheritance: Superclasses, subclasses, constructors in inheritance, method overriding, polymorphism and dynamic binding, protected and package access, class hierarchies, abstract classes, methods and interfaces.	**Chapter 11**, Pages 673 - 748	Quiz on Chapter 15 **Exercise _15_05: page 984.**
7	05/20/06	• Exceptions & Stream I/O: Enhanced error trapping techniques using exceptions. • Sequential access, random access, text and binary files.	**Chapter 12**, Pages 749 – 812	Quiz on Chapter 11 **Exercise _11_01: page 744.**

8	05/27/06	• Advanced GUI Applications: Menu systems, look-and-feel	**Chapter 13**, Pages 813 – 883	Quiz on Chapter 12 **Exercise _12_06: page 812.**
9	06/03/06	• Applets and More: Swing applet classes, AWT classes, simple graphical shape drawing.	**Chapter 14**, Pages 883 - 956	Quiz on Chapter 13 **Exercise _13_05: page 879.**
10	06/10/06	**Final Exam**		Quiz on Chapter 14 **Exercise _14_05: page 956.**

HAWAII PACIFIC UNIVERSITY

Hawai'i Pacific University supports and protects the academic freedom of both the faculty and the students. The examination of partisan views, no matter how controversial, within the purview of a course of instruction, is the very life-blood of freedom of thought and inquiry in an educational institution within a free society.

Like all other rights and privileges in a free society, academic freedom is constrained by other freedoms and rights of individuals within the society. Academic freedom necessitates the recognition of significant contrary viewpoints and requires a degree of respect for the rights of others to hold such contrary viewpoints. Academic freedom requires differentiation between personal views and opinions and proven facts of broadly held conclusions within a discipline. It is neither possible nor desirable to attempt to enumerate the limits of academic freedom. In general, academic freedom is abused when important individual rights of others within the community are denied under the guise of academic freedom.

All members of the University will be expected to exercise their rights to academic freedom responsibility. (HPU Policies and Procedures)

ACADEMIC HONESTY POLICIES AND PROCEDURES

The University's policies and procedures regarding Academic Honesty are published for your review and information. Please read them carefully.

I. General Statement

The policy of Hawai'i Pacific University is clear regarding academic dishonesty. Any student who cheats on an academic exercise, lends assistance to others, or who hands in, as a completed assignment, work that is not his or her own will be penalized. The ultimate penalty is expulsion from the University.

The term "academic exercise" includes all forms of work submitted for points, grades, or credit.

II. Academic Dishonesty

The definition and classification of academic dishonesty includes:

A. Cheating.

1. The intentional use of or attempted use of unauthorized assistance, materials, information, and/or study aids in any academic exercise.
2. The act of collaborating and working together on any academic exercise (without the approval of the instructor) which is similar in appearance, content, and form so as to create doubt as to whether the work was truly the product of individualized effort.
3. Examples of cheating include but are not limited to:
   a. giving or receiving unauthorized assistance during examinations;
   b. submitting assignments that appear to be similar in appearance, content, and form to an assignment submitted by another person.

B. Plagiarism

1. The deliberate use or reproduction of ideas, words, or statements of another as one's own without proper acknowledgement or citation.
2. Examples of plagiarism include but are not limited to:
   a. using verbatim or paraphrased text without proper citation;
   b. submitting, without permission, the same written or oral material in more than one course;
   c. obtaining research or lab data from another individual or source but presenting it as one's own;
   b. paraphrasing so as to mislead the reader regarding the source;

C. Facilitating Academic Dishonesty

Intentionally or knowingly helping or attempting to help another to commit an act or acts of academic dishonesty as defined in this policy.

D. Fabrication

1. The intentional and unauthorized falsifying or inventing of any information or citation in an academic exercise or University document.
2. Examples of fabrication include but are not limited to:
   a. falsifying data or signatures on an official University document (e.g., registration form, college record, or transcript);
   b. misrepresenting a fact in order to obtain a course exemption, waiver, or withdrawal.

III. Procedures for Dishonesty Cases

A. Suspected cases of academic dishonesty will be dealt with by the instructor or instructors concerned with one or more of the penalties listed in paragraph B:

In each such instance, the instructor shall send a report of the incident (Academic Dishonesty Report Form) and the penalty imposed to the Vice President for Academic Administration through the appropriate college/school Dean.

- **Penalties**

Instructors may elect to assess one of the following penalties:

1. Require the student to redo the academic exercise or do a new academic exercise.
2. Give the student an "F" for the academic exercise and permit it to be redone.
3. Give the student an "F" for the course.
4. Remand the case to the appropriate dean for disposition. That dean may impose one of the foregoing penalties or remand the case to the Vice President for Academic Administration.
5. If the case is remanded to the Vice President for Academic Administration for disposition, that official may impose one of the foregoing penalties or remand **the case** to the Academic Affairs Conduct Review Board.
6. The Academic Affairs Conduct Review Board can recommend any of the appropriate academic sanctions listed on pages 48-49 of the HPU Student Handbook.

The Vice President for Academic Administration must approve the board's recommendations for them to be actuated.

- **Rights and Privileges**

1. Instructors may request that the Vice President for Academic Administration dispose of the case or refer it to the Academic Affairs Conduct Review Board.
2. The Vice President for Academic Administration may take the case for his or her own disposition, or refer it to the Academic Affairs Conduct Review Board.
3. The Academic Affairs Conduct Review Board procedures are described on page 49 of the *Hawai'i Pacific University Student Handbook.* **(December 2002)**

[Excerpts from pp. 35-37 of the *HPU Student Handbook 2002-2003*]