

GUIDELINES FOR CAPP SPECIAL STUDIES:

PROGRAMMING INDEPENDENT STUDY

As of Fall, 2009, new guidelines exist for independent study classes to insure a quality educational experience for all students enrolled. All projects undertaken in such classes must conform to the following general criteria:

1. There is a legitimate need for the independent study course (i.e., the project is meaningful and relevant, and no other existing class could fulfill the educational need).
2. The work entailed by the project is reasonable academically, and the timeline/deliverables are clearly specified.
3. The process for advising the student and for evaluating the student's work involves appropriate subject-matter and technical advisors.

If you are planning to take CAPP Special Studies for the independent study of programming, you will be expected to complete the equivalent of a regular programming course on a language of your choice. As part of these guidelines, you must provide us with a specific written proposal outlining your project in some detail, including:

- Exactly why you can't take one of the existing CAPP programming courses;
- The specific language you will learn, and why that particular language;
- Who will act as your learning advisor for the language you choose;
- Who will help you with the technical matters related to the programming exercises you will complete;
- What specific exercises you will complete and when.
- What final program you will complete to demonstrate your mastery of the language.

According to the new guidelines, it is your responsibility to specify the details of your project in a written proposal due at least two weeks prior to the pre-registration date in the semester before you expect to enroll in the independent study course. The proposal must be approved before you will be allowed to pre-register. The committee will provide you with feedback on your proposal as soon as possible, but it will be to your advantage to submit it to the committee as soon as possible. In your proposal, which should be at least 2-3 pages, you need to be very specific about how the bulleted points noted above will be addressed.

Here is an example of what a CAPP programming independent learning project might involve. This is only an example, but your proposed project should emulate this example in terms of its specificity with respect to readings, learning goals, and schedule. This example is based on an independent study course on Java that recently was offered by Dr. Michael Villano, a faculty member in Psychology and CAPP.

Dr. Villano represents the type of learning advisor you will need to identify for your programming independent study. You need to find someone who has a good working knowledge of the target language and its development resources, and who can help you develop a set of readings, learning objectives, and a learning schedule such as the following:

Readings

Java Game Programming chapter –pdf

Your basic Wikipedia entry: A bit advanced description of OOP:

http://en.wikipedia.org/wiki/Object-oriented_programming

Dont' Fear the OOP!

An amusing essay using trashy western novels as the domain to explain how to do object-oriented design with Java examples. A bit wordy, but takes a very basic approach to explaining many features of classes, subclasses and inheritance. Some of you might think it's a fun way to learn OOP and some of you might think it's just dorky.

<http://sepwww.stanford.edu/sep/ion/family/jos/oop/oop1.htm>

Sun's tutorial on OOP

<http://java.sun.com/docs/books/tutorial/java/concepts/index.html>

Sun follow up tutorial with much more detail on classes:

<http://java.sun.com/docs/books/tutorial/java/javaOO/classes.html>

Suggested language references:

Java	Deitel, P.J. & Dietel, H.M (2007)- <i>Java How to Program 7th Edition</i> . Pearson: Upper Saddle River, NJ.
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Big (1596 pages), expensive (\$108), but a complete course in a book.

Suggested software development references:

McConnell, S. (2004). *Code Complete 2*. Microsoft Press: Redmond.

Learning Objectives

The following learning objectives are intended to progress you through programming tasks in Java. Each task will result in a module of reusable code that can be adapted to new applications in the future. By the end of the semester, you should be able to:

- Confidently “compile and run” a computer program when you are provided source code in Java.
- Develop your own computer application.

- Select appropriate widgets and design and develop a graphical user interface in order to automate the collection of information from users
- Apply randomization techniques
- Validate and test your own programs and code

Schedule

Due 1/22	Read Chapter 1 <i>Assignment: Netbeans install, Hello World program</i>
Due 1/29	Read Chapter 2, Exercise 2.2.
Due 2/12	Read Chapters 3 and 4. Exercises 3.4, 3.5 (Hint set a = 1.0, you'll see), 4.2 and 4.4.
Due 2/26	Read Chapter 5, Exercises 5.1, 5.2, 5.3, 5.4 a-c, 5.7 and 5.8.
Due 3/5	Read Chapter 6, Exercises 6.2 and 6.3
Due 3/19	Read Chapter 7, Exercises 6.2 and 6.3 still due. Complete Exercises 7.1 a thru d, 7.8 a - d and 7.9 a & b
Due 3/26	<p>For the purpose of the Capt. Crunch decoder assignment, the following code snippet demonstrates how to convert chars to ints and back:</p> <pre> char ch = 'A'; System.out.println(ch); int j = (int)ch; //converts char to int System.out.println(j); char chNew = (char)(j + 13); //converts int to char System.out.println(chNew); </pre> <p>Chapter 8. "Look at" exercises 8.1 through 8.3 (you don't have to do the diagrams, just understand the concepts that are reviewed.) Then, you can do exercise 8.4 and if you have time 8.5.</p>
Due 4/2	Read Chapter 9 "Create our own objects", Do Exercise 9.1 and Madlibs
Due 4/14	Read Chapter 10 – "Arrays" 10.5, 10.6, 10.10 a. from scratch, b and c; 10.13
Due 4/21	Read Chapter 11 "Arrays of Objects" – 11.2

Due 4/23	Read Chapter 12 – “Objects of Arrays”- 12.2 & 12.3
Due 4/28 – last class day	Appendix C - Input and Output Optional: Appendix A - Program Development Plan Appendix B – Debugging
Due Last Day of Finals – May 8 th	Final Project – GUI based Blackjack game

Remember, this is an example, but it illustrates the kind of independent study project that would be acceptable to the CAPP committee under the new guidelines. Just like any other 3-credit course, this CAPP independent study course will involve a lot of work, but it will give you the opportunity to learn programming in an interesting and flexible way.

In summary, to enroll in a CAPP programming independent study course, you must:

- Identify a specific language and a willing language-expert advisor;
- State why you want to take that language and why you can’t take a normal CAPP language course.
- Submit a detailed written proposal at least two weeks prior to the pre-registration period in the semester before the course will be taken.
- Obtain written approval from the CAPP review committee that the proposal meets the necessary requirements outlined above.

All proposals should be submitted by email to the Director of CAPP at ccrowell@nd.edu.