A. Protocol

Course Name: Application Programming II  
Course Number: CIS 220  
Credits: 3  
Prerequisites: CIS 120 with a C- or better and CIS 110 with a C- or better  
Maximum Class Size (face-to-face): 35  
Maximum Class Size (online): 35  
*Justification for online class size is due to the highly-technical nature of the course.

B. Objectives of the Course:  
Upon completion of this course the student will be able to:  
a. Recognize the components of Object-Oriented Programming including Classes, Objects, Data Abstraction, Encapsulation, Inheritance and Polymorphism.  
b. Design and create solutions to business problems using a prominent object oriented programming language.  
c. Discuss and illustrate the definition of a data structure  
d. Discuss, illustrate and write programs that use lists, stacks and queues  
e. Analyze various solutions and their time complexities  
f. Evaluate and debug programs.

C. Catalog Description:  
This course provides students with advanced techniques for design and implementation of business solutions using object-oriented programming concepts. This course also covers the data structures that are typically learned in a traditional CS2 course. Emphasis is placed on efficient software development for business related problems. Students are required to write, test and run programs. Prerequisite: CIS 120 Application Programming I with C- or better and CIS 110 Intro to Information Systems with C- or better. Three credits.

D. Outline of the Course:  
1) Designing Object-Oriented Solutions to Business Problems  
2) Object-Oriented Programming Basics  
a. Classes and objects  
b. Methods  
c. Information hiding  
d. Encapsulation  
e. Inter-object communication  
f. Public interface and private implementation  
g. Constructors and destructors  
3) Inheritance  
4) Operator Overloading\  
5) Polymorphism  
6) Introduction to data structures  
a. Overview of data structures  
b. Definitions  
c. Initial examples  
d. Big Oh analysis
7) Arrays, lists, stacks and queues
   a. Definitions
   b. Operations
   c. Implementations
   d. Applications

E. Teaching Methodology:

1) Traditional Classroom Methodology

   This course will be taught using some lecture/discussion method followed with a majority of class time using hands-on lab activities on the presented concepts. Some cooperative group method will be employed during appropriate sections of the course.

2) Online Methodology

   This course will be taught using a variety of methods including lecture videos, activities, group collaborative learning, and discussion boards.
   Quality Matters™ Statement – The online course follows the standards of the Quality Matters™ rubric. An online homework system is required in this course.

F. Text

   There are a vast array of texts available. Below is a list of possible texts.


G. Assessment Activities:

1) Traditional Classroom Assessment

   Various assessment methods are used, at the discretion of the instructor, and can include exams, quizzes, tutorials, homework assignments, programs/projects/labs. An online homework submission system is used in this course.

2) Online Assessment

   Various assessment methods are used, at the discretion of the instructor, and can include exams, quizzes, tutorials, homework assignments, programs/projects, wikis, online journals and labs. An online homework system is required in this course.

H. Accommodations for Students with Disabilities:

OSD
Revised December 2012
Students with disabilities:

- Reserve the right to decide when to self-identify and when to request accommodations.
- Will register with the Office for Students with Disabilities (OSD) each semester to receive accommodations.
- Might be required to communicate with faculty for accommodations, which specifically involve the faculty.
- Will present the OSD Accommodation Approval Notice to faculty when requesting accommodations that involve the faculty.

Office for Students with Disabilities

Requests for approval for reasonable accommodations should be directed to the Office for Students with Disabilities (OSD). Approved accommodations will be recorded on the OSD Accommodation Approval notice and provided to the student. Students are expected to adhere to OSD procedures for self-identifying, providing documentation and requesting accommodations in a timely manner.

Contact Information:

- Location: Azorsky Building – Room 105
- Phone: (724) 938-5781
- Fax: (724) 938-4599
- Email: osdmail@calu.edu
- Web Site: www.calu.edu (search “disability”)

I. Supportive Instructional Materials, e.g. library materials, web sites, etc.

**Library Materials:**

Books located in the PILOT catalogs, library databases (Ebscohost, CIOS, Proquest, Lexis-Nexis) which include books, journals, magazines, and newspapers. Examples of holdings at the Louis L. Manderino Library are:


Additional Information for Course Proposals

J. Proposed Instructors: Dr. Gina Boff, Dr. Gary DeLorenzo, Dr. Lisa Kovalchick, Dr. Tony Rodi or any other tenure-track CIS faculty from the Department of Mathematics, Computer Science and Information Systems.

K. Rationale for Course: Course already exists and being updated for Global Online delivery.

L. Specialized Equipment or Supplies Needed: None

M. Answer the following questions using complete sentences:

1. Does the course require additional human resources? No, the course is already being taught.

2. Does the course require additional physical resources? No. The current physical resources on campus can accommodate the teaching of this course.

3. Does the course change the requirements in any particular major? No.

4. Does the course replace an existing course? No, this course does not replace any existing courses.

5. How often will the course be taught? This course will be taught once every year.

6. Does the course duplicate an existing course in another Department or College? No.

7. What is the recommended maximum class size for this course? Recommended class size for this course is 35 for online sections, due to the highly-technical nature of the course.

N. If the proposed course includes substantial material that is traditionally taught in another discipline, you must request a statement of support from the department chair that houses that discipline. This course does not include substantial material from another discipline.

O. Please identify if you are proposing to have this course considered as a menu course for General Education. If yes, justify and demonstrate the reasons based on the categories for General Education. The General Education Committee must consider and approve the course proposal before consideration by the UCC. No, this course will not be part of the Gen Ed menu.