THE UNIVERSITY OF WESTERN ONTARIO
FACULTY OF ENGINEERING

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

ES 036 – PROGRAMMING FUNDAMENTALS

COURSE OUTLINE – 2007-2008

OBJECTIVES:

This course is intended to establish a foundation for Computer Programming with specific emphasis on Engineering problems and applications. The course will cover the use of Object-Oriented Analysis, Design, and Implementation (using C++) techniques, along with Testing according to the specified Requirements of the program. Computer Programming will be treated as part of the Engineering Process, and as such will be contextualized through the course according to the Engineering Profession.

CONTACT HOURS:

3 lecture hours, 2 laboratory hours

PREREQUISITES:

None.
Note: It is the student's responsibility to ensure that all Pre-requisite and Co-requisite conditions are met or that special permission to waive these requirements has been granted by the Faculty. It is also the student's responsibility to ensure that they have not taken a course listed as an Anti-requisite. The student may be dropped from the course or not given credit for the course towards their degree if they violate the Pre-requisite, Co-requisite or Anti-requisite conditions.

CEAB:

ES: 90% ED: 10%

TOPICS:

1. Introduction to Computer Programming.
2. The software development process.
3. Types and names of objects
4. Expressions: Variables and Operators
5. Statements, Syntax, and Control Structures
6. Objects and Classes
7. Implementation of Classes
8. Inheritance
9. Dealing with differences
10. Encapsulation
11. Event-Driven Programming

TEXTBOOK:

Engineering Problem Solving with C++, Delores M. Etter, Jeanine A. Ingber, ISBN: 0130912662, Prentice Hall, 2003.

EVALUATION:

In order to pass the course, a student <u>must obtain a passing grade in final examination</u>. A student who fails the final examination shall receive a final grade not greater than 48%.

1. Class participation   – 5% (recorded by 'Clicker' device)
2. Laboratory Assignments – 20%
3. Midterm examination   – 25%
4. Final examination   – 50%

Regular laboratory component consists of 10 laboratory exercises that must be completed during the laboratory period (see "Important Dates" section for details).

*For those who have previous experience in C++ and programming, an alternate laboratory component is available. If you wish to undertake this alternate laboratory component, you must inform the instructor before the first laboratory assignment is due. Instructor will assess your proficiency and decide if you are eligible to take the alternate lab. Assessment method is solely at the discretion of the instructor. Once elected, you **MUST** follow the alternate laboratory procedure and **cannot** go back to regular laboratory assignments. These alternate laboratory exercises consists of few mini-projects and are designed to be **challenging**, but **more interesting**. Sign-up sheets for the alternate laboratory track are available on WebCT.*

Marks for the laboratory component are the same in both tracks.

ATTENDANCE:

Any student who, in the opinion of the instructor is absent too frequently from class or laboratory periods in any course, will be reported to the Dean (after due warning has been given). On the recommendation of the Department concerned, and with the permission of the Dean, the student will be debarred from taking the regular examination or other assignments in the course.

PLAGIARISM:

University Policy states that cheating, including plagiarism is a scholastic offence. The commission of a scholastic offence is attended by academic penalties that might include expulsion from the program. If you are caught cheating, there will be no second warning. (see Scholastic Offence Policy in the Western Academic Calendar).

All source code is subject to similarity detection using appropriate software. All submissions will be included as source documents in the reference database for the purpose of detecting plagiarism of subsequent submissions to the system. Any significant similarity as deemed by the instructor will be treated as a scholastic offence.

USE OF PERSONAL RESPONSE UNITS:

A personal response unit (commonly known as a "clicker") is a small radio frequency transmitter that resembles a TV remote. You purchase your clicker in the Book store and register it to your student number for use in all classes using this technology. In class, instructors can ask a variety of structured questions to which you may respond by pressing the appropriate button on your respective clicker. Individual responses are collected and displayed as a graph at

the front of the room. If the instructor chooses, these responses may also be saved for future analysis.

In this course, clickers will be used primarily to promote engagement during lecture. They will also provide you with credit and feedback on their lecture preparation and/or participation. More information about clickers are provided on the course website.

Clickers and Codes

Only **Interwrite Personal Response System (PRS)** clickers produced by **Interwrite** will work in this course. They are available in the University book store.

Responsibility

It is your responsibility to ensure that your clicker is registered and functional.

Academic Record

% Questions Answered	Participation Grade
1 – 30	1
31 – 55	2
56 – 72	3
73 – 89	4
90 and above	5

In this course, your clicker use will be recorded in class and will become part of your academic record. As such, your clicker record will be afforded the same degree of security, confidentiality and transparency that is customary for test marks etc. You can earn course credit through clicker participation as follows. Clicker participation questions will be asked during lecture as instructors decide. At the end of the year, we will determine the total number of clicker questions asked. The proportion of questions that you answered will determine the fraction of the available participation grade (5%) that you earned as shown. Clicker participation requires only that you try; you don't have to get the questions right to get this part of your course grade. You can monitor the success of your clicker record through the appropriate link on the course WebCT site.

Privacy

Although clickers may be used in the classroom for polling opinions and/or collecting some types of personal data (e.g. How many people have ever written a computer program?) such responses will not become part of your academic record and will not "count" toward clicker participation grade. Such non-academic data will either be recorded anonymously or not at all. (A simple anonymization exercise will invite you to swap clickers with a neighbour for the moment.)

Research

We want to ensure that clickers are used in ways that are most helpful to your learning. We have therefore invited independent researchers to investigate your experience of this technology. Your participation in this research project is completely voluntary and will have no bearing on your course grades. As course instructors, we will never know who agrees to participate nor will we know who gives any particular comment. Your clicker data will not be used for any non-academic or research purpose without your consent. For any research study in which you are invited to participate, you will be provided with a Letter of Information with an opportunity to give or withhold consent. This research will not replace the usual end of term Course Evaluation given by the University.

Academic Integrity

Since clicker records are used to compute a portion of course grades, the use of a clicker other than your own is an academic offense. In a test, lab, lecture or tutorial, possession of more that one clicker, or that of another student, will be interpreted as intent to commit an academic offense.

COURSE INSTRUCTORS:

Section 1: Dr. Jagath Samarabandu, TEB 351, x80058, jagath@uwo.ca
Section 2: Dr. Abdelkader Ouda, TEB 359, x81299, aouda@eng.uwo.ca

CLASS WEB SITE:

WebCT – http://webct.uwo.ca (click on "The University of Western Ontario" button)

CONSULTATION CONTACTS:

Dr. Jagath Samarabandu: Wed. 12:30 – 2:30pm, TEB 351. Other times by appointment only.
Dr. Abdelkader Ouda: Tue and Thu. 12:30 – 2:30pm, TEB 359. Other times by appointment only.

IMPORTANT DATES

Labs are due on the day of your lab section in SEB 1015

1. Lab sections (SEB 1015) are on Tuesdays 2:30-4:30pm, Wednesdays 7:00-9:00pm, Thursdays 8:30am-10:30am and 10:30am-12:30pm

2. **Orientation** – Sept. 11, 12, 13.   **Lab 1** – Sept. 18, 19, 20.   **Lab 2** – Sept. 25, 26, 27.
   Lab 3 – Oct. 2, 3, 4.   **Lab 4** – Oct. 9, 10, 11.   **Review** – Oct. 16, 17, 18.
   Lab 5 – Oct. 23, 24, 25.   **Lab 6** – Oct. 30, 31, Nov. 1. **Lab 7** – Nov. 6, 7, 8.
   Lab 8 – Nov. 13, 14, 15.   **Lab 9** – Nov. 20, 21, 22.   **Lab 10** – Nov. 27, 28, 29

3. Midterm: **Monday, October 22/2006 6:30-8:30pm** in TC341, TC342, TC348A and TC348B
4. Final Examination Review and help: Dec. 4, 5 in SEB 1015

WHERE TO FIND HELP

Help is available during lab hours in SEB 1015. Lab exercises must be completed during the lab section in which you are registered. However, you are free to drop by during any lab period if you would like to talk to any of these teaching assistants. Help is also available on the discussion section on WebCT