CS 5 – Fundamentals of Computing
Spring 2009 Syllabus

Overview:	Welcome to CS 5! In this course, we will learn about the **wonder** of computing. Computing is integral to every discipline, and computers are everywhere, so it's a very important topic! I want you to become comfortable with computers and familiar with the field of computer science. I want to help you develop thinking skills such as problem-solving and abstract reasoning. And, I want you to have fun!
Catalog Description:	No prior computer or programming experience required. Introduction to basic principles of computing, problem solving, algorithmic thinking, and abstraction. Overview of hardware and software. Applications including spreadsheets, databases, artificial intelligence, networks, and web development. Social and ethical issues including viruses, privacy, security, intellectual property, anti-trust, and the digital divide.
Course Goals in Terms of Departmental Learning Outcomes:	**C1. Core: Know the core ideas and methods in computer science** a. Develop abstract reasoning skills b. Develop quantitative and analytical reasoning skills c. Gain broad exposure to the discipline of computer science d. Gain fluency in basic computing **C2. Communication: Communicate ideas in writing or orally** a. Learn to communicate technical information through written assignments, papers, and oral presentations **C3. Creativity: Independently learn new ideas and techniques and apply them in solving problems** a. Learn how to create a website and online portfolio b. Learn how to develop an algorithm **C4. Connections: Incorporate knowledge into interdisciplinary framework and personal faith** a. Examine ethical issues in computing from a Christian perspective b. Gain a broader appreciation of science through attending natural and behavioral science seminars c. Examine the ways in which computing interacts with other disciplines
Professor:	Dr. Kim Kihlstrom kimkihls@westmont.edu http://homepage.westmont.edu/kimkihls/ Office: Math/CS Building (near post office) 565-6864 Cell phone: 570-6722 (until 10 pm)
Office Hours:	Mon. 2:00 - 5:00 pm, Tues. 3:15 - 4:15, Wed. 2:00 - 3:00 pm, and by arrangement

General Education:	This course meets the general education requirement for the "***Reasoning Abstractly***" component of the "***Common Inquiries***" section. The ability to **reason about a problem** in an **abstract**, rather than a concrete, manner is a uniquely human ability human and thus is central to our understanding and pursuit of the liberal arts. For example, when invited to a barbecue, as humans we can respond to the statement "bring a side dish," even though this command is not fully specified. It is not a concrete statement, in which all of the details (e.g., What kind of side dish? How do I prepare it? In what container do I bring it?) are specified, but is instead abstract. **It is this ability to reason abstractly that allows us to manage the complexity of human life.** **Abstract reasoning is central to computer science**. In this course we will study computer systems as successive layers of abstraction that hide the details of other layers. For example, when we are dealing with the software layer in writing a program, we don't need to be thinking about the details of how the hardware carries out the instructions. We will also use abstract reasoning to look at the representation of information in a computer and explore the idea of an abstract data type. Further, we will reason abstractly when we develop algorithms to solve problems, and translate those algorithms into pseudocode and computer instructions. Additionally, we will employ abstract reasoning when we talk about functional decomposition and object-oriented design. This course also meets the general education requirement for the "***Quantitative & Analytical Reasoning***" component of the "***Common Skills***" section. Since many phenomena in our world can best be understood through quantitative and analytic methods, students should develop the ability to interpret, evaluate and communicate quantitative ideas. In this course we will use mathematical models to represent computer networks and other physical systems. We will also grow in understanding and communicating numeric data including the use of spreadsheets and graphical representations of data such as weather.
Required Texts:	Schneider and Gersting, ***Invitation to Computer Science: C++ Version***, 4th ed., Thomson Learning, 2006 Lambert and Whaley, ***Invitation to Computer Science Laboratory Manual: C++ and Java***, Thomson Learning, 2006
Assignments:	**Reading assignments** are to be done **before** the relevant class period. At the beginning of most class sessions, students will be asked to write the answer to a question based on the reading. These free-writes will form the basis for further class discussion. **Homework assignments** will be due about once a week. Late assignments will be subject to a 50% penalty. Assignments will be submitted and grading will be done online through Eureka. You will develop an **online portfolio** as your **final project** in this course. This project will be due in three stages during the last month of class. The online portfolio will contain links to your work in this course and others. It is meant to be a living document to which you add materials over time, and will ultimately serve as a resource for you as you apply for employment or graduate school.
Exams:	Exams will include a midterm on **Thursday, March 5** and a cumulative final on **Thursday, May 7**. The exams will be in-class exams and will stress both qualitative understanding of the concepts and the ability to solve problems and write algorithms.

Class Sessions:	TTh 1:15-3:05pm in Temporary Classroom 2 Regular class attendance is essential for success in the class. Class sessions will include free-writes, discussion of principles and ideas, abstraction, algorithm development, group problem solving, demonstrations, and laboratory exercises. We will use laptop computers in class; thus, you need to **bring your laptop to class each day**. If you do not own a laptop with wireless access capability, you may check one out for the time you are enrolled in this course. Additionally, each student must attend at least two natural and behavioral science seminars during the semester, typically held on Fridays at 3:30.
Online Materials:	Online materials, including assignments and other course information, are available on the Eureka course management system at https://eureka.westmont.edu/. In addition, lectures will make use of Ubiquitous Presenter, an interactive presentation system designed at UC San Diego. In class, I will use a Tablet PC to ink on lecture slides. You will be able to access these slides during class through a browser, and you can contribute to class through your browser. Additionally, the inked slides will be stored on a web site where you can view them after class. The website is located at: http://ubiquity.westmont.edu/UbiquitousPresenter-1.0.0/.
Grades:	The final grade for the course will be calculated as follows: Assignments: 25% Class participation and seminar attendance: 15% Midterm: 20% Portfolio project: 20% Final exam: 20%
Honesty:	Working together on assignments is encouraged. However, **copying** another student's assignment (or portion of an assignment) is **not** allowed and will result in an F for the assignment. If you work together, you must include a note or comment indicating with whom you worked and on which part of your assignment. **Your assignment should never be the same or essentially the same as someone else's!** Repeated or major violations will result in an F for the course. "To plagiarize is to present someone else's work—his or her words, line of thought, or organizational structure—as our own. This occurs when sources are not cited properly, or when permission is not obtained from the original author to use his or her work. By not acknowledging the sources that are used in our work, we are wrongfully taking material that is not our own. Plagiarism is thus an insidious and disruptive form of dishonesty. It violates relationships with known classmates and professors, and it violates the legal rights of people we may never meet. "Another person's 'work' can take many forms: printed or electronic copies of computer programs, musical compositions, drawings, paintings, oral presentations, papers, essays, articles or chapters, statistical data, tables or figures, etc. (The Learning Skills Centre, 1999). In short, if any information that can be considered the intellectual property of another is used without acknowledging the original source properly, this is plagiarism." From *Westmont College Plagiarism Policy*, http://www.westmont.edu/_academics/pages/provost/curriculum/plagiarism/