CS120A – Computing Concepts & Tools

Fall Term: September 8 – December 15, 2005

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Office Hours: Mo: 4:25 - 6:25 PM; Tu: 2:00 - 4:00 PM & 5:15 - 6:15 PM; and Th: 2:00 - 4:00 PM

COURSE DESCRIPTION:

This course is an introduction to computing. Students will become familiar with the file structure of an operating system and with storing and retrieving information on a computer. Students will learn how to use a software development environment to write, compile, debug, execute, and test programs written in Jython (Python) and C++. The course will introduce students to the fundamental concepts of programming, tools, and its application to problem solving. This course does not fulfill a Computer Science major requirement in the Bachelor of Science degree program. **Prerequisite:** MA112 or equivalent.

COURSE OBJECTIVES:

Students will be introduced to the fundamentals of computing, data processing, multimedia, networks and data communications, the Internet, software programming and development, and using application software for multimedia applications. Topics covered include computer architecture (data storage, data manipulation), software design principles (operating systems, networks, algorithms, programming languages, software engineering life cycle, software quality), data organization (data structures, file structures, database structures), theory of computation, media computations (pictures, sounds, text, movies), Web design, and other topics.

COURSE TEXTBOOK:

- Mark Guzdial, Introduction to Computing and Programming in Python: A Multimedia Approach, 1st edition, Prentice Hall, 2005, ISBN: 0-13-117655-2 (with CD). [This is a ***MAJOR textbook*** *for this class*].
- Peter Norton, Introduction to Computers, 6th edition, McGraw-Hill, 2005; see also http://www.norton.glencoe.com/; [This is an ***OPTIONAL textbook*** *for this class*].
- Lecture slides, laboratory manuals, links to additional topics of interest, and links to materials developed by other scholars can be downloaded from http://www.rivier.edu/faculty/vriabov/.

RECOMMENDED BOOKS:

- Brookshear, J. Glenn: Computer-Science: An Overview, 7th Edition; Addison-Wesley, Reading, MA, (2002); see also http://www.awlonline.com/brookshear/.
- Lawrence Snyder, Fluency with Information Technology: Skills, Concepts, and Capabilities, Addison Wesley, Reading, MA, 2003.
- Stefano Ceri, Dino Mandrioli, and Licia Sbattela, The Art & Craft of Computing, Addison Wesley, Reading, MA, 1998.
- H. L. Capron and J. A. Johnson, Computers: Tools for an Information Age, 7th edition, Prentice Hall, 2002.
- George Beekman, Computer Confluence: Exploring Tomorrow's Technology, 4th edit., Prentice Hall, 2001.
- Russell L. Shackelford, Introduction to Computing and Algorithms, Addison Wesley, Reading, MA, 1998.
- Nell Dale, Essentials of C++: A Lab Course Through Arrays, Jones & Bartlett Publishes, 1999.
- Software Engineering Resources: http://www.comp.lancs.ac.uk/computing/resources/ser/SE.links.html.

SOFTWARE:

- Jython Environment for Students (JES) is available on the CD in the back of the Guzdial's textbook or can be downloaded from http://coweb.cc.gatech.edu/mediaComp-plan/MediacompSoftware/.
- The C++ manual is available: http://www.rivier.edu/departments/mathcs/Resources/Catalog/VisualC++.htm

CLASSROOM POLICIES:

a) Attendance: Active participation requires attendance and arrival to class in time to be prepared for work when the class period begins. You are expected to attend all classes. Much of the learning will take place in classroom activities that cannot be duplicated easily outside of class. If you miss class, you are responsible for doing all classroom activities you missed, getting the notes from a classmate, and turning in all work on the day it is due. If you miss more than two classes, your absences will be reported to the registrar and you must meet with the professor to discuss the advisability of your remaining in the course for the remainder of the semester. Students who miss three classes may be withdrawn from the course and receive disciplinary action from the college (see Rivier College attendance policy). If you anticipate that job-related duties or prior commitments will cause several absences, please discuss the matter with the instructor outside of class.

b) Honesty policy: All work turned in on tests, quizzes, and the final must be entirely your own. Behavior contrary to this will result in a grade of F on the test. Serious infractions may result in an F for the course. Similarly, the paper you write for your project must not be plagiarized. See library discussion on plagiarism. Regarding homework, the instructor will not give you credit for any work that is copied from another source (from a classmate, instructor, a text, the answer key, web assistance, tutor, etc.). Take notes while getting help, but put aside the notes as you attempt to do the problems on your own.

c) Home Assignments: Appropriate problems are assigned regularly for credit and require a sincere effort and amount of a student's time (additionally at least four hours a week) to ensure success. Any late assignments will receive a 10% grade discount. Assignments must be completed on time. Only those situations involving instructor's permission will be exempt from this policy. Instructor must know in advance of class that a student will not be present or an assignment will be late.

d) Lecture/Problem solutions: The primary source of exam material is derived from what is done in class. Your notes are keys to success on exams. Each student should maintain a notebook exclusively for this course.

e) In Computer Lab, students will complete exercises and section labs from the CD in the Guzdial's textbook and Labs published on the CS120 Website: http://www.rivier.edu/faculty/vriabov/cs120a_labs.htm.

f) The C++ manual resource is available on-line: http://www.rivier.edu/departments/mathcs/Resources/Catalog/VisualC++.htm

g) Students need to have computer accounts, know how to access their accounts, and organize course labs properly in some designated cs120 folder in their account.

h) Classes and labs are scheduled on Tuesdays & Thursdays, 4:00 PM – 5:15 PM.

i) Final Exam is scheduled on Thursday, **December 15, 2005, 2:00 PM – 4:00 PM**.

AMERICANS WITH DISABILITIES ACT (ADA):

Rivier College wants to provide reasonable accommodations to students with disabilities. To accomplish this goal effectively and to ensure the best use of our resources, timely notice of a disability must be provided to the Office of Special Services for verification and for evaluation of available options. Any student whose disabilities fall within ADA should inform the instructor within the first two weeks of the term of any special needs or equipment necessary to accomplish the requirements for the course. To obtain current information on this procedure, contact the Office of Special Services at telephone extension 8497.

EXAMINATIONS and GRADING:

Five Homework Assignments	30%
Four Labs	20%
Midterm Exam	25%
Final Exam	25%

COMPUTER LABORATORY:

Students will be required to use computers in the College Computer Lab and classroom for completing exercises and section labs, and coding and testing the software using the Jython and Microsoft Visual C++ development environment. If you have any problems with the equipment, contact Sister Martha's office in the Computer Lab.

CLASS SCHEDULE:

Week	Date	Subject	Output from Class	Guzdial's Text Reading	*Optional Reading*
01	Sept. 8	Intro to Computer Systems, Multimedia & the Internet. Media Computations	Installing *Python* & *Jython* Environment	**G:** Ch. 1	*N: Ch. 1*
02	Sept. 13	Standard and Alternative Input Devices. Files.	Programming in *Jython*	**G:** Ch. 2	*N: Ch. 2*
02	Sept. 15	Output Devices. Making a Program.	Programming in *Jython*	**G:** Ch. 2	*N: Ch. 3*
03	Sept. 20	Transforming Data Into Information. How Pictures are Encoded.	Modifying Pictures with *Jython*	**G:** Ch. 3	*N: Ch. 4a*
03	Sept. 22	Color Values in Pictures. Creating a Negative. CPUs Used in Personal Computers.	Modifying Pictures with *Jython*	**G:** Ch. 3	*N: Ch. 4b*
04	**Sept. 27**	**Lab #1: Review of G-Chapters 1-3, C++ Manual Review**	**Homework #1 due**	**G:** Chs. 1-3	*N: Chs. 1-4*
04	Sept. 29	Modifying Pixels. Types of Storage Devices.	"Mirroring" with *Jython*	**G:** Ch. 4	*N: Ch. 5a*
05	Oct. 4	Transforming Pictures. Red-Eye. Blurring. Measuring and Improving Drive Performance.	Transforming Pictures with *Jython*	**G:** Ch. 4	*N: Ch. 5b*
05	Oct. 6	Making Pictures by Combining Pieces. The Operating System and User Interface.	Drawing on Images with *Jython*	**G:** Ch. 5	*N: Ch. 6*
06	Oct. 11	How Sound is Encoded. Manipulating Sounds. Networking Basics.	Modifying Sounds with *Jython*	**G:** Ch. 6	*N: Ch. 7a*
06	Oct. 13	Changing the Volume of Sounds. Networking the Home, the Office, and the Globe.	Modifying Sounds with *Jython*	**G:** Ch. 6	*N: Ch. 7b*
07	**Oct. 18**	**Lab #2: Review of G-Chapters 3-6, C++ Programming**	**Homework #2 due**	**G:** Chs. 3-6	*N: Chs. 5-7*
07	**Oct. 20**	**MIDTERM EXAM**	**MIDTERM**	**G:** Chs. 1-6	*N: Chs. 1-7*
08	Oct. 25	Internet Basics. Splicing & Backwards Sounds.	Modifying Sound Samples with *Jython*	**G:** Ch. 7	*N: Ch. 8a*
08	Oct. 27	Getting Online, Working Online; TELNET, FTP. Making Sounds.	Making Sounds with *Jython*	**G:** Ch. 8	*N: Ch. 8b*
09	Nov. 1	Word Processing and Desktop Publishing Software. Manipulating Sounds.	MSWord. Making Sounds with *Jython*	**G:** Ch. 8	*N: Ch. 9a*
09	Nov. 3	Designing Programs. Spreadsheet Software.	MSExcel. Designing & Debugging *with* Jython	**G:** Ch. 9	*N: Ch. 9b*
10	**Nov. 8**	**Lab #3: Review of G-Chapters 7-9, C++ Debugging**	**Homework #3 due**	**G:** Chs. 7-9	*N: Chs. 8-9*
10	Nov. 10	Creating Text. Presentation Programs.	MSPowerPoint. Creating Text with ***Jython***	**G:** Ch. 10	*N: Ch. 10a*
11	Nov. 15	Modifying Text. Database Management Systems.	MSAccess. Modifying Text with ***Jython***	**G:** Chs. 10, 11	*N: Ch. 10b*
11	Nov. 17	Making Text for the Web. Graphics Software; Understanding Multimedia.	Writing Programs to Generate HTML	**G:** Ch. 11	*N: Chs. 11a-b*
12	**Nov. 22**	**Lab #4: Review of G-Chapters 10 & 11, C++ Testing**	**Homework #4 due**	**G:** Chs. 10, 11	*N: Ch. 10-11*
12	**Nov. 24**	**NO CLASSES**	**NO CLASSES**		
13	Nov. 29	Creating Movies. The Basics of Information Systems; Building Information Systems.	Generating Animations	**G:** Ch. 12	*N: Chs. 12a-b*
13	Dec. 1	What Makes a Computer Fast? Creating Computer Programs; Programming Languages and the Programming Process	Clock Rates, Storage, Object-Oriented Programming	**G:** Ch. 13	*N: Chs. 13a-b*
14	**Dec. 6**	Living with Computers; **Review of G-Chapters 12 & 13**	**Homework #5 due**	**G:** Chs. 12, 13	*N: Chs.12, 13, 14*
14	Dec. 8	Course Review; Preparation for Final Exam			
15	**Dec. 13**	**READING DAY**	**READING DAY**		
15	**Dec. 15**	**FINAL EXAM (2:00 PM - 4:00 PM)**	**FINAL EXAM**	**G:** Chs. 8-13	*N:Chs.8-13*