CPS121 A - INTRODUCTION TO PROGRAMMING

Professor and Lab L2:	Russ Tuck russ.tuck@gordon.edu cell: 408-335-0890	Fall Semester, 2015 MWF 8-9am KOSC 125 Lab L1: T 9:45am-12:45 pm
Lab L1:	Russell C. Bjork russell.bjork@gordon.edu	Lab L2: T 1:15-4:15 pm Both in KOSC 118
Office:	KOSC 243	
Hours:	MW 9:10-10:10, T 4:15-6:00, F 9:10-10:00 & 1:00-2:00, or drop in when door is open, or by appointment	
Course Site:	Blackboard sites for CPS121A + CPS121L1 (for both labs)	

CATALOG DESCRIPTION:

Introduces fundamental programming concepts using Python. Topics include nature of algorithms, essential control structures, data representation, and programming paradigms. Weekly programming laboratories.

COURSE OBJECTIVES:

There are literally hundreds of programming languages. One comprehensive list starts at A+, wanders through languages with names like C#, Scheme, and Tcl, and finally ends with ZPL. In fact, new languages are developed all the time. However, there are some common structures, which bind a majority of these languages together. In this course, the student will be given the opportunity to learn and understand these essential components of programming.

In particular, upon completion of this course, you should be able to:

1. Think algorithmically.
2. Develop various algorithms,
3. Express simple algorithms as programs using the basic capabilities of the Python language.
4. Perform simple algorithmic manipulations on picture, sound, text and movie files using Python.
5. Manipulate information represented in html or xml using Python.

TEXTS: Guzdial and Ericson. *Introduction to Computing and Programming in Python, A Multimedia Approach* (4th ed) (Upper Saddle River, NJ: Prentice Hall, 2016) ISBN: 978-0-13-402554-4

Elkner, Downey, and Myers *How to Think Like a Computer Scientist: Learning with Python* (2nd ed) http://openbookproject.net/thinkcs/python/english2e/

ONLINE TUTORIALS: w3Schools.com. *HTML Tutorial*.
http://www.w3schools.com/html/default.asp

w3Schools.com, *Basic XML Tutorial*.
http://www.w3schools.com/xml/default.asp

PREREQUISITES:

While no formal prerequisite coursework is required before attending this course, it is important for all students to be aware that this class has components which require strong mathematical reasoning, logical reasoning, and abstract reasoning. Consequently, students with weak ability in one or more of these areas are strongly encouraged to discuss this with the professor during the first week of classes to determine whether the course is suitable for their needs.

COURSE TECHNIQUES AND PROCEDURES

Since this course is primarily concerned with the development of certain skills and habits, regular practice with evaluation will be the heart of the course. For most units of material, you will be asked to read a portion of one or both of the text books or an online tutorial.

Class sessions will include a discussion and amplification of the material in the text and the presentation of further examples and supplementary material. You should not expect to grasp everything presented in the text when you first read it; however, you should note areas that are unclear to you and be prepared to raise questions about them in class.

As is true with any skill, the only way you can really learn programming is by doing it. For this reason, you will have opportunities to practice what you are learning through weekly laboratories and several programming projects.

COURSE REQUIREMENTS AND EVALUATION:

1. You will be expected to read most of the Guzdial text, and selected chapters from the Elkner text, as assigned in the schedule below. Reading assignments should be completed BEFORE the class hour in which the topic is discussed, as specified in the schedule below. Studies show that quizzes help students learn, so there may be a short reading quiz on the days reading is due, and other in-class quizzes. (Quizzes will be worth a total of 3% of the final course grade; the lowest 3 scores will be discarded. Missed quizzes cannot be made up.) Our classroom discussion will not rigidly follow the order of material in the text, nor will it be confined to material covered there.

2. The chapters in Guzdial include a set of Problems at the end. Though these will not be formally assigned, we will do a number of them in class sessions. For this reason, you should be sure to bring your book with you to class when we are discussing topics in it. Note that these problems may be valuable study aids, especially if you check answers with someone else.

3. Weekly laboratories will focus on gaining practical experience with the material covered in the book and/or in lecture. Lab assignments will be posted on Blackboard ahead of time, and **must** be read over carefully **before** coming to lab. In some cases, you will be explicitly directed to study certain material in preparation for the lab. For most laboratories, there will be a writeup to turn in. There may also be a quiz given at the start of the lab hour (based on your reading of the lab assignment and any assigned pre-lab preparation) and/or a quiz based on the work done in lab given when you complete the lab. Each lab with a formal writeup/ quizz(es) will account for 2% of the course grade (24% total for twelve such labs). The tentative lab emphases are shown in the course schedule.

4. Four programming projects will be assigned. These projects must be done in accordance with the handout "Guidelines for Computer Science Projects", which will be distributed with the

first project. You are expected to read these carefully and comply with them exactly.
The first three projects will each be worth 8% of the final course grade and the last project
will be worth 12%. (36% total for the 4 projects).

5. A mid-term examination and a final examination (worth 17% and 20% of the final course
grade, respectively) will be given as shown in the course schedule. Each exam will assume
familiarity with material in the text, covered in lecture, and/or used in labs or projects.
Exams will be open book (course text only), open notes.

6. Your final grade will be computed on the basis of a weighted sum of the items listed above.

Summary:		
	Quizzes	3%
	Labs	24%
	Projects	36%
	Exams	37%
		100%

The following are minimum guaranteed grades for the percentages indicated:

	93% - 100%: A	90% - 92.9%: A-
87% - 89.9%: B+	83% - 86.9%: B	80% - 82.9%: B-
77% - 79.9%: C+	73% - 76.9%: C	70% - 72.9%: C-
67% - 69.9%: D+	63% - 66.9%: D	60% - 62.9%: D-

BEING RESPONSIBLE:

At times, the amount of work required may seem insurmountable – however it is expected that each
student be responsible to strive to do his or her best. On this note, pilfering or borrowing answers from
a classmate or other resource is not acceptable. It may result in a failing grade and any further action
deemed appropriate by the college.

COMPUTER USE IN CLASS:

If you have a laptop, you are welcome to bring it to class. If you don't, please contact me so I can help
arrange a loaner if it is ever important to have one. We will sometimes work in pairs with one laptop.

Electronic devices (computers, tablets, phones, etc.) may be used in class ONLY for class work,
including note taking, consulting class materials, and in-class assignments.

Using electronic devices for non-academic activities during class (email, social networking, games,
internet browsing, etc.) will cause the student to lose the privilege of using electronic devices in class.

POLICY STATEMENT ON EXTENSIONS AND INCOMPLETES:

1. Extensions of the due dates for projects will be given in the event of extenuating
circumstances (such as illness, personal emergency) <u>IF</u> you submit a brief written request to
the professor as soon as possible after the circumstances arise. This request will be initialed
(if approved) and will be returned to you. You must attach it to the piece of work for which
the extension was granted.

2. A grade of Incomplete will be given without penalty <u>IF</u> you are unable to complete the course work by the last day of the term due to major illness or other similar emergency. Again, a written request should be submitted. Such a request will only be granted if you are substantially up-to-date with your course work and were making good progress in the course up to the time that the difficulty arose. Of course, you must complete all work for the course by the midpoint of the next semester in accordance with College policy.

3. A grade of Incomplete with a penalty of one letter grade to be applied in the final grade computation <u>MAY</u> be given if you are unable to complete all the course work for reasons other than those noted above. You must make a written request, and your progress in the course, class attendance etc. will be taken into consideration in determining whether to grant it. Again, you must complete all work for the course by the midpoint of the next semester.

ATTENDANCE POLICY:

Regular class attendance is expected of all students, and class attendance will be recorded. Absences from class will be classified as "documented" or "undocumented". A documented absence is one where <u>written</u> documentation is submitted supporting an absence from class due to circumstances beyond the student's control. An undocumented absence is any other absence, including one which could qualify as documented if proper documentation were submitted.

Students who have more than three undocumented absences during the semester should expect to see their final grade reduced by 1% for each undocumented absence over 3, and students who have more than 12 undocumented absences will fail the course automatically. The allowance of 3 undocumented absences may be reduced by one for each documented absence over 3 - e.g. a student who has 2 documented absences may be allowed only 1 undocumented absence without grade penalty. (This will not be applied retroactively, though)   Note that it is <u>not</u> necessary to document absences unless there are more than three total absences; for most students, this will avoid the need to submit documentation. A student who anticipates the need to miss more than three classes due to athletic competitions or other student activities should review the college's attendance policy in0 the catalog, and should then discuss alternatives to class attendance with the professor at the start of the semester.

A student who is habitually late will have late arrival for class counted as a half absence for that class, and a student who sleeps through most or all of a given class session will be counted as absent for that class.

You may ask the professor to waive this policy for you if you have an A average in this course as of the mid-term exam. If you wish to take advantage of this exemption, you must so inform the professor. However, the attendance policy will be reimposed if your subsequent work deteriorates.

STUDENTS WITH DISABILITIES:

Gordon College is committed to assisting students with documented disabilities (see Academic Catalog Appendix C, for documentation guidelines). A student with a disability who may need academic accommodations should follow this procedure:

1. Meet with a staff person from the Academic Support Center (Jenks 412 X4746) to:
a. make sure documentation of your disability is on file in the ASC,

b. discuss the accommodations for which you are eligible,
c. discuss the procedures for obtaining the accommodations, and
d. obtain a **Faculty Notification Form**.

2. Deliver a Faculty Notification Form to each course professor *within the first full week of the semester;* at that time make an appointment to discuss your needs with each professor.

Failure to register in time with your professor and the ASC may compromise our ability to provide the accommodations. Questions or disputes about accommodations should be immediately referred to the Academic Support Center. (See also Grievance Procedures in Student Handbook).

TENTATIVE COURSE SCHEDULE - May change to fit the class's needs (or other realities).

Date	Topic(s)	Reading	Written Work Due
W 8/26	Course Introduction		
F 8/28	Introduction to Computer Science and Media Computation	Guzdial ch. 1	
M 8/31	Introduction to Programming	Guzdial ch. 2; Elkner ch. 1	
T 9/1	Lab: JES and Python (1)		
W 9/2	Creating and Modifying Text	Guzdial ch. 3	
F 9/4	(continued)		
M 9/7	*Labor Day - no class*		
T 9/8	Lab: Strings (2)		
W 9/9	Modifying Pictures Using Loops	Guzdial ch. 4	
F 9/11	(continued)		
M 9/14	Using Selection with Pictures	Guzdial ch. 5	
T 9/15	Lab: Modifying Pictures 1 (3)		
W 9/16	Using Selection (continued)		
F 9/18	Modifying Pixels by Position	Guzdial ch. 6	(Start Project 1)
M 9/21	(continued)		
T 9/22	Lab: Modifying Pictures 2 (4)		
W 9/23	Variables, Expressions and Statements	Elkner ch. 2	
F 9/25	Functions	Elkner ch. 3	
M 9/28	Modifying Sounds Using Loops	Guzdial ch. 7	
T 9/29	Lab: Modifying Pictures 3 (5)		
W 9/30	Modifying Samples in a Range	Guzdial ch. 8	
F 10/2	Combining Sounds	Guzdial ch. 9	
M 10/5	Arrays and Lists	Elkner § 9.1-9.9	**PROJECT 1 DUE**
T 10/6	Lab: Manipulating Sounds 1 (6)		
W 10/7	Application of Arrays and Lists; Modeling and Simulation		(Start Project 2)
F 10/9	Building Bigger Programs	Guzdial ch. 10	
M 10/12	Review and Catch up		
T 10/13	Lab: Manipulating Sounds 2 (7)		
W 10/14	**MIDTERM EXAM**		**(MIDTERM EXAM)**
F 10/16	*Quad Break - no class*		
M 10/19	Files and Text	Guzdial ch. 11	
T 10/20	Lab: Building Bigger Programs (8)		
W 10/21	Files and Text (continued)	Elkner §10.7-10.9	
F 10/23	Accessing Data from the Web	Guzdial ch. 12	
M 10/26	Making Text for the Web; HTML	Guzdial ch. 13	**PROJECT 2 DUE**
T 10/27	Lab: Files and Text (9)		
W 10/28	(HTML continued)	Look over HTML Tutorial	

F 10/30	(continued)		(Start Project 3)
M 11/2	XML	Look over XML Tutorial	
T 11/3	*Day of Prayer - no lab*		
W 11/4	XML (continued)		
F 11/6	(continued)		
M 11/9	Boolean Expressions; More about Conditionals and Iteration	Elkner §4.2-4.7	
T 11/10	Lab: Creating HTML (10)		
W 11/11	(Boolean etc. continued)	Elkner §6.3-6.6	
F 11/13	Programming Paradigms		
M 11/16	The Functional Paradigm; Recursion	Guzdial ch. 16; Elkner § 11.6, 11.8, 11.9	**PROJECT 3 DUE;** (Start Project 4)
T 11/17	Lab: XML (11)		
W 11/18	(Functional / Recursion continued)		
F 11/20	The Object-Oriented Paradigm	Guzdial ch. 17	
M 11/23	Tuples and Dictionaries	Elkner § 11.1-11.3 Elkner § 12.1-12.4	
T 11/24	Lab: Project Work Session (optional if part I of project is turned in before lab)		**PROJECT 4 PART I DUE AT THE END OF LAB**
W 11/25	*Thanksgiving Break - no class*		
F 11/27	*Thanksgiving Break - no class*		
M 11/30	Searching and Sorting		
T 12/1	Lab: Functional Programming (12)		
W 12/2	Searching and Sorting (continued)		
F 12/4	Movies	Guzdial ch. 14	
M 12/7	Speed; Algorithms	Guzdial §15.2.3-15.2.6	
T 12/8	Lab: Project Work Session (optional if Part II of project is turned in before lab)		
W 12/9	Review and Catch up		**PROJECT 4 PART II DUE**

Monday - 12/14 - 12:00-2:00 FINAL EXAM (from http://www.gordon.edu/finalexamsfall)
(Cumulative with Emphasis on Material Since the Midterm)