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CS-0109: PROGRAMMING CREATIVITY

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COURSE INFORMATION

Instructor Info:	<p>Lee Spector</p> <p>lasCCS@hampshire.edu</p> <table border="1"> <tr> <td>Office Extension:</td> <td>x5352</td> </tr> <tr> <td>Office Hours:</td> <td>Regular office hours: Tuesdays 9:30-11:00, Wednesdays 1:00-2:30, and Thursdays 2:00-3:30. Other times can be set up by arrangement (in person or via email). Sign up for regular office hours, advising day meetings, and occasionally other signup times on Hampedia here.</td> </tr> </table>	Office Extension:	x5352	Office Hours:	Regular office hours: Tuesdays 9:30-11:00, Wednesdays 1:00-2:30, and Thursdays 2:00-3:30. Other times can be set up by arrangement (in person or via email). Sign up for regular office hours, advising day meetings, and occasionally other signup times on Hampedia here .		
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TA Info:	<table border="1"> <tr> <td colspan="2">Alec Goebel</td> </tr> <tr> <td colspan="2">acg10@hampshire.edu</td> </tr> <tr> <td>Office Extension:</td> <td>x4356</td> </tr> </table>	Alec Goebel		acg10@hampshire.edu		Office Extension:	x4356
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Office Extension:	x4356						
Term:	2012F						
Meeting Info:	<table border="1"> <tr> <td>Tuesday</td> <td>12:30 PM – 01:50 PM Adele Simmons Hall (ASH) 126</td> </tr> <tr> <td>Thursday</td> <td>12:30 PM – 01:50 PM Adele Simmons Hall (ASH) 126</td> </tr> </table>	Tuesday	12:30 PM – 01:50 PM Adele Simmons Hall (ASH) 126	Thursday	12:30 PM – 01:50 PM Adele Simmons Hall (ASH) 126		
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Description:	<p>This course is an introduction to computer science and programming framed by the question, "Is it possible for a computer to be creative?" The core areas of computer science will be introduced, including algorithms, complexity, computability, programming languages, data structures, systems, and artificial intelligence, with an eye toward the insights that they can provide about issues of computational creativity. Students will complete several programming projects to demonstrate developing technical skills and engagement with the themes of the course.</p>						
Course Objectives:	<ul style="list-style-type: none"> ○ To understand the core concepts and areas of study in computer science. ○ To learn how to program, or how to program better, and more generally to develop the ability to turn abstract ideas into running code. ○ To appreciate the significance of computational models of cognition and creativity. ○ To develop and present a software portfolio. ○ To work collaboratively with classmates. 						
Evaluation Criteria:	Each student is expected to attend consistently, to read all assigned readings, to participate actively in class discussions, and to complete the following assignments:						

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<p>First Code</p>	<p>A short programming assignment to demonstrate basic understanding of the <i>Processing</i> programming environment.</p> <p><i>Details</i></p> <ol style="list-style-type: none"> Do one or both of the following: <ul style="list-style-type: none"> Produce and submit a Processing program that creates a different but not completely random pattern of colored shapes each time it is run. Produce and submit a Processing program that uses my turtle graphics code but draws something else interesting, preferably variable. Be prepared to demonstrate and discuss your work in class on the due date. <p>Everything should be turned in to a folder on the "gibson" file server with your name as the folder name. Each project should include an exported applet folder so that you can demonstrate your applet by directing a web browser to http://gibson.hampshire.edu/~cs109/ and navigating to the proper folder. Procedures for exporting applets and uploading them to gibson will be covered in class, and are documented here.</p>
<p>First Code Presentation</p>	<p>In-class presentation of the first code assignment; approximately 3 minutes.</p>
<p><i>Processing</i> Tool</p>	<p><i>Processing</i> code that may help in the production of creative programs by others in the class.</p> <p><i>Details</i></p> <ol style="list-style-type: none"> Produce and submit a Processing program that you think may be useful in the construction of a larger program that demonstrates computational creativity. Be prepared to demonstrate and discuss your work in class on the due date. <p>Everything should be turned in to a folder on gibson with your name as the folder name.</p>
<p>Tool Presentation</p>	<p>In-class presentation of the tool project; approximately 3 minutes.</p>
<p>Final Project</p>	<p>A significant <i>Processing</i> program that exhibits machine creativity.</p> <p><i>Details</i></p> <ol style="list-style-type: none"> Produce and submit a Processing program that exhibits machine creativity, preferably using one or more tools developed earlier in the course (by yourself or by others). Be prepared to demonstrate and discuss your work in class on the due date.

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	<p>your work in class on the presentation dates.</p> <p>Everything should be turned in to a folder on gibson with your name as the folder name.</p>
Project Presentation	In-class presentation of the final project; approximately 5 minutes.
<p>Students are urged to consult with the professor before starting the Tool or the Final Project. Course evaluations will briefly describe the completed projects; students should bear this in mind when choosing the topics and forms for their projects.</p>	
<p>Additional Info:</p>	<hr/> <p>Division I Distribution Credit</p> <p>Successful completion of this course satisfies the Division I distribution requirement in Mind, Brain, and Information. This course provides opportunities for satisfaction of Division I cumulative skills requirements in Quantitative Skills and Independent Work.</p> <hr/> <p>Texts</p> <ul style="list-style-type: none"> ◦ <i>The Pattern on the Stone: The Simple Ideas that Make Computers Work</i>, by Daniel Hillis, 1998. ◦ <i>Getting Started with Processing</i>, by Casey Reas & Ben Fry, 2010. <hr/> <p>Software</p> <p>The <i>Processing</i> programming environment, available from http://processing.org/</p> <p>Lee's Processing examples (zipped): http://hampshire.edu/lspector/courses/lee_processing_examples.zip</p> <hr/> <p>Facilities</p> <p>Students may use their own computers and/or the Macs in ASH 126, which will be available at various posted hours. The <i>Processing</i> programming environment can be run under Mac OS X, Windows, or Linux, and students can work on whatever platform they prefer, but all submitted work must run under Mac OS X. Students can use the class folder on the "urza" file server to store files; access instructions will be provided in class. Students should not expect files left on the Macs in ASH 126 to persist; the discs on those machines may be erased without notice at any time. Students may find it convenient to use a thumb drive to transport files to and from class.</p> <hr/> <p>Difficulty/Level</p> <p>This course is intended to serve students with a wide range of backgrounds, including students with no computer experience and students with significant computer and programming experience. Students with little previous experience should resist being intimidated by the more difficult readings, etc., and bear in mind that I take background into account in writing evaluations. If a reading or a class discussion is over your head, try to extract the gist of it (which may be all that you need at this point in your learning) and talk to me if you need to understand more. Students with extensive previous experience should note that the class is structured to</p>

provide ample opportunities for more advanced work--feel free to talk to me about ideas for projects, etc.

Demonic Coding

Many class sessions will be dedicated in part or entirely to "demonic coding." In a demonic coding session the class is split into two groups and the available time is split into two periods. In the first period one of the groups is coders and the other is demons; in the second period the roles are reversed. Coders sit at workstations and work on their own projects for the entire period. Demons rotate among the coders at announced times, observing and interacting with one coder at a time. Demons may ask questions and/or make suggestions, and coders must dedicate a percentage of their time (approximately 50%) to demonic interactions. Each student must have access to his/her current work files every day -- on a laptop computer, or a thumb drive, or a networked server, etc. -- so that he/she will always be ready to participate as a coder in a demonic coding session.

Policies in Regards to Illness, Epidemic, or Pandemic

If you have a fever, please stay home, take good care of yourself, and contact me by email or phone. When you are able to work at home you should be able to participate in classes and to submit work electronically. If your illness makes it impossible for you to meet the course deadlines then contact me and we will negotiate an accommodation.

Plagiarism Policy

Hampshire College has a rigorous policy on plagiarism, outlined in detail in the student handbook. As stated in College documents "Plagiarism (from the Latin for 'kidnapper') is a term covering everything from inadvertently passing off as one's own the work of another because of ignorance, time constraints, or careless note-taking, to hiring a ghost writer to produce an examination or course paper." In particular, it covers false citation, false data, intentional poor documentation, papers written by others, unacknowledged multiple authors or collaboration, unacknowledged multiple submission, and other forms of academic dishonesty. The penalties are severe, so you should always be proactive in identifying all sources. When in doubt you should ask your me about what is and isn't appropriate.

In this course we will often be sharing and borrowing code. This is an important aspect of the course and an important aspect of modern programming practice. This does not mean, however, that it is acceptable to submit code that is not your own without acknowledging sources. Sources should be clearly and explicitly provided in everything that you produce.

Schedule

The following is subject to change. Adjustments will be announced in class.

Tuesday 12:30-1:50 PM	Thursday 12:30-1:50 PM
	September 6 First class

	<p>In class: Introductions, syllabus, overview</p>
<p style="text-align: right;">September 11</p> <p>Before class:</p> <ul style="list-style-type: none"> ◦ Read: Hillis preface and the "Talking to the Computer" section of chapter 3; R&F chapters 1 & 2 ◦ Explore: processing.org <p>In class:</p> <ul style="list-style-type: none"> ◦ Discuss First Code assignment ◦ Introduction to Processing (dots, turtle, etc.) ◦ Demonic coding 	<p style="text-align: right;">September 13</p> <p>Before class:</p> <ul style="list-style-type: none"> ◦ Read: Lem, Trurl's Electronic Bard; R&F chapter 3 <p>In class:</p> <ul style="list-style-type: none"> ◦ Demonic coding
<p style="text-align: right;">September 18</p> <p>In class:</p> <ul style="list-style-type: none"> ◦ First Code assignment presentations <p>Due:</p> <ul style="list-style-type: none"> ◦ First Code assignment 	<p style="text-align: right;">September 20</p> <p>Before class:</p> <ul style="list-style-type: none"> ◦ Read: Hillis chapters 1 & 2 <p>In class:</p> <ul style="list-style-type: none"> ◦ Electrons to algorithms ◦ Discuss Tool Project ◦ Demonic coding
<p style="text-align: right;">September 25</p> <p>Before class:</p> <ul style="list-style-type: none"> ◦ Read: R&F chapters 4 & 5 <p>In class:</p> <ul style="list-style-type: none"> ◦ Text, numbers, control ◦ Demonic coding 	<p style="text-align: right;">September 27</p> <p>Before class:</p> <ul style="list-style-type: none"> ◦ Read: Boden Precis <p>In class:</p> <ul style="list-style-type: none"> ◦ Creativity and computational art ◦ Demonic coding
<p style="text-align: right;">October 2</p> <p>Before class:</p> <ul style="list-style-type: none"> ◦ Read: R&F chapters 6 & 7 <p>In class:</p> <ul style="list-style-type: none"> ◦ Notations and control ◦ Demonic coding 	<p style="text-align: right;">October 4</p> <p>In class:</p> <ul style="list-style-type: none"> ◦ Tool & final project brainstorming ◦ Demonic coding
<p style="text-align: right;">October 9</p> <p>OCTOBER BREAK (no class)</p>	<p style="text-align: right;">October 11</p> <p>Before class:</p> <ul style="list-style-type: none"> ◦ Read: R&F chapters 8, 9, & 10 <p>In class:</p> <ul style="list-style-type: none"> ◦ Data structures

		<ul style="list-style-type: none"> ◦ Functions ◦ Demonic coding
In class:	October 16	In class: October 18 <ul style="list-style-type: none"> ◦ Demonic coding
In class:	October 23	In class: October 25 <ul style="list-style-type: none"> ◦ Tool assignment presentations Due: <ul style="list-style-type: none"> ◦ Tool assignment
Before class:	October 30	November 1 <i>ADVISING DAY</i> (no class)
<ul style="list-style-type: none"> ◦ Read: Hillis unread sections of chapter 3 + chapter 4 In class: <ul style="list-style-type: none"> ◦ Computability ◦ Demonic coding 		
In class:	November 6	Before class: November 8 <ul style="list-style-type: none"> ◦ Read: Hillis chapter 5 In class: <ul style="list-style-type: none"> ◦ Complexity ◦ Demonic coding
In class:	November 13	Before class: November 15 <ul style="list-style-type: none"> ◦ Read: Hillis chapter 6 In class: <ul style="list-style-type: none"> ◦ Number systems ◦ Demonic coding
Before class:	November 20	November 22 <i>THANKSGIVING</i> (no class)
<ul style="list-style-type: none"> ◦ Read: Hillis chapter 8 In class: <ul style="list-style-type: none"> ◦ Artificial Intelligence ◦ Demonic coding 		
Before class:	November 27	Before class: November 29

<ul style="list-style-type: none"> ◦ Read: Hillis chapter 9 <p>In class:</p> <ul style="list-style-type: none"> ◦ Evolutionary computing ◦ Demonic coding 	<ul style="list-style-type: none"> ◦ Read: McCaffrey and Spector <p>In class:</p> <ul style="list-style-type: none"> ◦ AI & creativity ◦ Demonic coding
December 4	December 6
<p>In class:</p> <ul style="list-style-type: none"> ◦ Demonic coding 	<p>In class:</p> <ul style="list-style-type: none"> ◦ Final project presentations
December 11	
<p>In class:</p> <ul style="list-style-type: none"> ◦ Final project presentations <p>Due:</p> <ul style="list-style-type: none"> ◦ Final project ◦ Portfolio ◦ Self evaluation 	

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