**COURSE INFORMATION – Summer 2010**

**Course No./Title:**  
CS4HS – Computational Thinking and Computational Doing for High School Teachers

**Sec. Number:**  
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**Time/Days:**  
Friday, June 25, Saturday, June 26 and Sunday, June 27

**Bldg/Room:**  
The CU Boulder ATLAS Institute - ATLAS 229

**Instructors:**  
Dr. Clayton Lewis  
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**Department(s):**  
College of Engineering and Applied Science  
Department of Computer Science & ATLAS Institute

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**Course Objectives and Content**

This three day hands-on workshop will take place at the University of Colorado at Boulder’s Alliance for Technology Learning and Society (ATLAS) Institute. Workshop participants will learn concepts related to two highly successful K-12 outreach projects in CU’s Computer Science department, iDreams and eCSite, both sponsored by NSF.

iDreams brings computational thinking activities into public schools by providing training and support for teachers. The iDreams curriculum has been implemented in inner city, remote rural and Native American communities. iDreams has already enrolled more than 1300 students in its first semester, a majority being girls. The students learn to design and implement their own computer games and computational science models, using the AgentSheets programming environment. More than three quarters of the girls and more than two thirds of the boys who have participated have asked to participate in further game design courses.

eCSite (Engaging Computer Science in Traditional Education) places CS PhD students in K-12 classrooms to promote inclusion of computing concepts in academic disciplines outside computing, and to enhance the ability of the PhD students to communicate their work effectively to lay audiences. GK12 fellows will assist the teachers during hands on activities in the workshop, as well as present some of their curriculum development work.

The workshop will also feature a discussion of the broad view of information technology and its social significance represented by CU’s ATLAS Institute. ATLAS (Alliance for Technology Learning and Society) brings together CU students and faculty from many disciplines, including engineering, natural science, humanities, and the arts, to address challenges and opportunities in the development and application of information technology.

This goal will be pursued according to the following objectives:

(1) To enable participants to bring computing concepts and activities into their high school classes. We will
approach this both by providing hands on experience with the widely-used AgentSheets visual programming system, and by discussing learning materials developed in our NSF-sponsored GK-12 and iDreams outreach projects. As the workshop title suggests, the aim is to convey both key concepts and important skills, in a form that enable high school teachers to engage their students with the material.

(2) To provide participants with information about opportunities involving the use of computing ideas and skills in a wide range of disciplines and occupations that they can share with their high school students.

The course will emphasize student-to-student interaction, and development of new computing skills through hands on projects.

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**Agenda:**

**Day 1 – Friday, June 25**
- Introduction to computational thinking (conceptual)
- Introduction to AgentSheets (hands on)
  
**Afternoon:**
- Google visit
- Panel on opportunities (at Google)
- AgentSheets (hands on) game design

**Day 2 – Saturday, June 26**
- AgentSheets (hands on) computational science
  
**Afternoon**
- Computational thinking concepts and activities in the high school curriculum (GK12 faculty and fellows)
- The meaning of Information Technology: CU’s ATLAS Institute

**Day 3 – Sunday, June 27**
- Intro to virtual worlds
- Curriculum workshop (teachers develop ideas for their own classes)
- Follow on: opportunities in iDreams and GK12

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**Assignments:**

**Day 1 – Friday, June 25:**
- Reflection paper on hands-on experience with a visual programming tool. *Due Saturday at 9am*

**Day 2 – Saturday, June 26:**
- Reflection on the implications of computing, communication, and information technology for the future of the high school curriculum. *Due Sunday at 9am*

**Day 3 – Sunday, June 27:**
- Reflection on incorporating computational concepts in your classroom. *Due Tuesday, June 29 9am via e-mail to Dr. Clayton Lewis (clayton.lewis@colorado.edu)*

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**Grading:** The grading for this course will be determined by the following criteria:
- Attendance
  - Being physically present in class
- Participation
  - Including questions & conversations in class
- Assignments
  - Type written, Proofread and spell checked, quality in content

Attendance for the entire 2 ½ day workshop is required for full credit. Students are encouraged to raise and discuss issues in class pertaining to the course material. Course assignments and papers will be calculated into
course grades. In case of emergency, students should attempt to reach instructor by telephone, e-mail, or voice-mail.

Ethical Standards: This course follows the University Honor Code
The following actions will not be tolerated and will be grounds for academic penalty as deemed appropriate by the instructor and in compliance with University Honor Code.

1. Individual papers submitted by any student, written in part or in whole by someone other than that student, unless it is a team paper specified by the instructor
2. Vandalism, destruction of property, stealing
3. Violation of ITLL or CU guidelines and standards

These actions shall be considered to constitute fraud under the University Honor Code or unacceptable or criminal behavior. The penalties can include, but are not limited to, a reduction in assigned grade, receiving an F on the assignment or for the course, or monetary reimbursement and personal responsibility to correct the violation. Any discovered act of academic dishonesty by a student in this course will be reported to the Boulder Campus Honor Code Council.

Disabilities Information
If you qualify for accommodations because of a disability, please submit to the instructor a letter from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Willard 322, and www.Colorado.EDU/disabilityservices

Information Regarding Religious Observances
Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, please contact the instructor at least two days in advance of absence. See full details at http://www.colorado.edu/policies/fac_relig.html

Behavioral standards
Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to such behavioral standards may be subject to discipline. Faculty have the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which they and their students express opinions. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. See polices at http://www.colorado.edu/policies/classbehavior.html and at http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code

The University of Colorado at Boulder policy on Discrimination and Harassment
(http://www.colorado.edu/policies/discrimination.html)
The University of Colorado policy on Sexual Harassment and the University of Colorado policy on Amorous Relationships applies to all students, staff and faculty. Any student, staff or faculty member who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at http://www.colorado.edu/odh