

RENAISSANCE COMPUTING @ UNL WORKSHOP

Breakout Session Report

CS1-Engineering



Q1. What computing-related topics or skills are essential for your students to be competitive in their field?

- Programming skills (which language(s))? Computational concepts? (See Survey)
 - Emphasize problem solving, algorithm development for engineering problems and not programming language syntax
 - Encourage design tools such as flowchart – very important
 - Syntax and mechanics of the programming language not very important
 - Also, use very basic concepts (and not too complex concepts)such as iteration, file I/O to help understand and visualize how to solve problems
 - Use user-friendly IDEs that provide instant feedback on syntax
 - Start with interpreted language and not compiled language
 - Engage college level curriculum committee
 - Provide real connection to engineering



Q2. How would a CS1 course improve your curriculum?

- Enrollment? Retention? Research potential? Etc.
 - Lose most of the students in the first 3 semesters
 - Does not affect enrollment
 - Does affect retention – students in freshman year are eager to learn specific engg disciplines rather than programming
 - However, programming is essential for theoretical research.
 - Can be used to integrate computing into the whole curriculum.
 - May act as an introduction to engineering disciplines by solving problems from different disciplines
 - Collaborative projects possible eventually
 - tangible products on “portfolios”



Q3. If a CS1 course is properly designed to meet your needs, do you see the course becoming a required course in your department? If yes, when?

- CSCE150 – is already required for many disciplines
- Include problem solving from different disciplines
- There is no intro to engg course available. This may be a perfect course to introduce to problems from different disciplines.
- EE offers an ELEC122 Introduction to Problem solving. If this course CS1- engg is restructured, the other course ELEC122 – intro to problem solving can be eliminated.



Q4. What would be your concerns about whether your students could do well in a CS1 course?

- Math background (algebra/trigonometry)?
 - No problem
 - ME students would have taken Calc I
- Student motivations? Student mis/perceptions?
 - May want to include some CS0 topics
 - Major problem is the acceptance and use of the coding environment. Select user-friendly IDE, preferably interpreted
 - Tool to be used is very important for student perception of the course's value. Presently, many of our students dislike code writing – they do not see it as necessary for their careers.
 - Level editors from computer games???
 - Student's acceptance of coding environment
 - Motivation to study CS – societal impact, computer literacy
 - Extensive coding could be a problem for student motivation.
 - Assignments should be carefully designed to help with retention.



Q5. What are the math requirements for your students? When do they usually complete those requirements?

- This is to help us determine the depth and breadth of the CS topics to be taught in CS1
 - 2 years – 3 Calculus and PDE course
 - ME – required linear algebra and statistics
 - Numerical methods - elective



Q6. What are the discipline-specific topics that you would like to see included in CS1?

- As lab assignments, as lectures, as homework assignments?
- Work with the different engineering departments.
- Database, Internet programming, software tools?
 - NOT MUCH INTEREST IN THESE TOPICS (SEE THE SURVEY)
- Language tools – Matlab, Labview, Maple and if a programming language is to be taught, prefer C



Q7. What kind of computing resources do you have at your department?

- Open labs for students to do programming hw? Or lab assignments?
 - ME has a 20 seat computer lab
 - Two college labs, can accommodate 20 each, set up for instructions
 - College of engineering has license for Mathematica
 - Need to look at college level licenses for others
 - Great need for a help desk at COE staffed by preferably COE graduate students to help students with their assignments.
- System admin?
 - Not much; there is a great need
- Available for CSE to install program compilers?
 - Need to work out the details; but not much problem foreseen.



Q8. Are you interested in participating in the TI grant later? If yes, role?

- As Co-PIs/Senior Personnel
- Help write the proposal? Help with course development? Co-teaching? Help promote the project? Recruitment of students?
 - Sohrab Asgarpour – help write the proposal, help with the course development
 - Yasar Demirel - help write the proposal, help with the course development , co-teaching



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Current Engineering requirement

Engg Discipline	Current requirement
BSEN	150E, 155, 156, 251, 251K, 252D, MIST250
AGEN	150E, 155, 156, 251, 251K, 252D, MIST250 - ?
CHME	CSCE150A
CIVE	CSCE150A
CNST	-
ELEC	150E, 155, 156, 251, 251K, 252D, 310
ENGM	?
IMSE	CSCE155/150E & 251K or 251U
MECH	CSCE150E



Q7. Issues to be addressed by COE curriculum committee – CS1 engg course slated for Fall2009

1. COE curriculum committee's recommendation on Topics/computational skills required (we do have a list from the workshop attendees. I will summarize the recommendations and send them to you.)
2. Need a COE curriculum committee recommendation on - How about starting with Matlab/Labview?? and introducing C at the end (List of tools from the workshop - Matlab, Labview, Mathematica, Maple - Ideally, it would be nice to have a variety of tools but we need to consider the other limiting factors also such as availability, cost of licensing, expertise etc. So, it may helpful if this is narrowed down to two tools.)
3. COE's recommendation on the credit hours - likely to increase from 3 to 4 hours - this course will also serve as an introduction to different engineering disciplines through problems assigned from different disciplines. **Note that some Engineering students take our Matlab course (3 hours) and 251K (1 hour, using C) to learn both Matlab and C. If the new CS1-Engineering covers both, then having CS1-Engineering as a 4-hour course would allow Engineering students to take just this course with minimal impact on their curricular requirements.**
4. A Contact/point person in major/each department to collect and develop a set of problems in different disciplines.

