**CS1301 – Course plan**

I teach my class in **4 phases**, as follows:

* **Phase 1.** General introduction – 5 sessions
* **Phase 2.** Getting more formal about algorithms – 4 sessions
* **Phase 3.** Reinforcement of phase 2 and addition of recursion – 8 sessions
* **Phase 4.** Testing & debugging. UDT & Linked lists – 6 sessions

My midterms are after phases 2, 3, and 4.

More specifically, here is what I expect my students to know at the end of each phase:

* **Phase 1.** 
  + Good understanding of what computer science is and what it can contribute to
  + Notions of CS history
  + Know of problem-solving strategies and be able to ask clarifying as well as probing questions
  + Understand the need and concepts of memory (and some types) including arrays and linked lists, conditional and repetition structures, methods [at level 1]
* **Phase 2.** 
  + Be able to trace a simple algorithm with memory manipulation (including arrays) and simple instructions (with conditional and repetition structures) [level 2]
  + Be able to design a simple algorithm (for a problem similar to some seen in class) using some or all of the above concepts [level 2]
  + Be able to articulate how to approach a simple problem [level 1-2]
* **Phase 3.** 
  + Be able to trace algorithms with memory manipulation (including arrays) and simple instructions (with conditionals and repetitions) [level 3]
  + Be able to design a relatively simple algorithm using some or all of the above concepts [level 2-3]
  + Understand recursion: be able to trace it, to design a very simple recursive algorithm, to debug a recursive algorithm [level 1-2]
* **Phase 4.** 
  + Understand and be able to design Black-Box and White-Box strategies for testing [level 2]
  + Understand the need for user-defined types [level 1] and be able to design one to address the need of a specific application [level 2]
  + Understand the principle of linked-lists and their manipulation in algorithms, be able to trace simple algorithms using linked lists [level 1]

**Comments & Thoughts.**

**1/** My course is organized the way it is to **nurture competencies**. You will observe that some skills first appear as level 1 in a given phase and are expected to be met at a higher level later during the semester. I view my course as a layer course: once a skill has been introduced, it should be used as much as possible throughout the rest of the semester, but expectations should vary. This also allows students to “fail within” the semester without failing overall, since they get to practice and be tested on similar topics throughout.

**2/** I believe that if we follow these general phases, we can keep our **teaching flexible** and personal while ensuring that we are moving at a similar pace as the other two sections.

**3/** **Phases could match deadlines in the labs**, with an alternation of mini labs and challenge labs like we did in Fall 2016. Mini labs are easier to grade for TAs and relieve students from the stress of frequent heavy labs. The only concern is the feedback we give to students if some submit work early while others wait until the deadline.