PURDUE
UNIVERSITY

Dan's Suggestions for Problem-Solving Courses

1. Starting the course:
   - work from the SYLLABUS
   - get a course file if possible
   - form a study group to work weekly on homework/old tests
   - plan a regular time each evening to review your days' lecture; to annotate and augment your notes
   - plan regular exercise as well (get a date book, use a schedule and to-do lists)

2. Your notes:
   - are worth at least hundreds, possibly thousands to obtain
   - keep them in a permanent book or binder
   - find a study partner taking the same course, trade missing notes
   - review notes daily for completeness (will you remember that detail in a month's time?)
   - if you are absent, tell Prof. in advance (for courtesy, ask what will be covered, get to know Prof. under good circumstances, impress them)
   - visit Prof. for missing handouts, offer feedback on course or lecture content

3. Regular review & augmentation of your notes:
   - self question (ask yourself 'What is the key idea?', 'Why is this important?')
   - summarize and rewrite your notes into more meaningful and compact forms
     - matrixes
     - outlines
     - concept maps
     - file cards
     - cheat sheets
   - review your material during regularly scheduled times when you have no homework

4. Before tests/exams (review and study):
    - start one week in advance
    - be seen and ask questions at any review sessions offered
    - review your notes and problem sets. Choose likely exam Qs
    - review old exams (see Prof./library/files)
    - practice exams as realistically as possible -- fully solve problems
    - practice an old test with timing
    - review your practice efforts, compare material difficulties with syllabus

5. Cramming:
    - damage control, not mastery of material
    - indicates inadequate organization (don't put yourself through it AGAIN)
    - LARGELY not worthwhile
    - hard on the spirit/body
    - tend to only remember a few of the most recent skills and factors

6. The week before the test or exam:
    - get sleep and exercise
    - meet with your study group
    - keep things in scope/your sense of humor

7. Exam Strategy (what to do with the WHOLE thing)
    - try to relax (no coffee, try tea)
    - get there early, with extra pens, calculator and batteries, paper, watch/timer
    - don't cram after T-30 minutes (people-watch for stressed out peers instead)
    - get the paper, put down the pens and read it through
        - read through again, annotating Q's for:
            - which questions are easy/hard/long/hopeless?
            - which problems are worth how much/depend on other answers
            - did you see ALL of the questions
            - allot time to each Q (time budget)
            - plan 5-10 min at the end for a review
    - do an easy Q first (for your confidence), then plug through in value order
    - don't get stuck or stonewalled; when you hit a snag, skip onwards and return later
      (write the exam like an onion -- in thin layers)
    - watch your time

- review at T-5 or 10 minutes
- reward yourself afterwards

8. Exam tactics (what to do with the problems)
    - read the problem over
    - jot down notes about the problem on the paper (the grader should see everything you do, including scrap paper)
    - pick out and note (highlight, rewrite, tabulate) the key or salient facts
    - sketch a picture/diagram and label it
    - write down the related formulae
    - perform the miracle
    - check the results:
        - do they make sense?
        - do units/dimensions agree?
        - do they match an order-of-magnitude estimate?
        - do they agree with other parts of the same problem? (intuition)
    - if you are stuck:
        - describe in words HOW the problem is solved if you knew how to do X
        - estimate an answer anyway (use it if there is a part 2 built on part 1 and state words what you going to do and WHY)
        - crawl for yards - MIT grads get that way by partial credit - the instructor is most likely looking for your understanding and logic - unless the course is mathematics, algebra is not the issue - this is especially important if scaling is required
        - remember your timings, and the onion

9. The end game:
    - review everything you have written
    - write SOMETHING for every question (even if only why the problem is important) - graders need excuses to give you marks, especially in scaling situations
    - don't leave early - take all of the time permitted
    - reward yourself afterwards

10. Post mortem
    - with your study group, do the exam again - learn from it
    - if the exam was especially disastrous, rewrite it as a problem set and resubmit a photocopy to the Prof., along with your comments and interpretations of what went wrong for you - offer to

meet and discuss things with the Prof.

-if grades or results were atypically poor, take ACTION:

- reorder your schedule/life/study practices
- consider dropping the course

- keep things in scope