Thinking Critically

A+ Study Skills
Group Discussion

- What makes someone a critical thinker? What does “critical thinking” look like?

- What would you like to take away from this workshop?
Critical Thinking is evaluating whether we should be convinced that some claim is true or some argument is good, as well as formulating good arguments.

— Richard L. Epstein, *Critical Thinking*, p. 5)
A critical thinker is:

- Engaged
- Questioning
- Creative
- Open to several points-of-view

Higher Level vs. Lower Level Thinking

- Foundation: Define, Identify, Explain
- Top: Analyze, Compare, Critique, Create


Image from: www.spencerexperts.com
Taking Notes

• In Class
  • Underline, circle, star any items you do not understand so you can ask the professor or another classmate
  • Actively take notes during lecture and mark up your book after class to indicate what the professor discussed/emphasized
  • Ask Professor questions and ask for examples during class if you are confused

General Study Tips

• Create Your Own Study Guide
  • Turn titles, definitions, keywords, and concepts into questions.
    • Questions should elicit “so what?” answers rather than just definitions. What is the significance? What is this related to? How does x compare to y?
    • Use whatever method works for you: notecards, mind maps, charts, etc.

Image from: http://www.wikihow.com/Make-a-Mind-Map
Advantages of Study Groups

• Get motivated and avoid procrastination
• Really get to know the material
• Bolster your notes
• Benefit from one another’s strengths, study methods, and viewpoints
• Get help with challenging concepts
• Enjoy studying as a group rather than alone
• Build professional skills by working in a team


Montclair State University. Study group tips and advantages. Retrieved September 1, 2013 from:
Problem Sets

- Solving Problems
  - Read through the problem several times before starting.
  - State the unknown in your own words.
  - Write down all the variable that are given. Cross out any “extra” information.
  - Look through the equations and methods you have gone over in class and see what you can use. Make a plan for solving the problem. If it doesn’t work, try another plan!
  - Check your answer. Is it in the proper form? Does it work if you insert it back into the problem?

- Work on problem sets on your own before your study group meeting, discussion sections, tutoring appointment, or office hours.

http://www.eecs.berkeley.edu/Programs/ugrad/studytips.shtml
Problem Sets

• Problem Analysis
  • Sharpens your understanding of the material
  • Focus on the process used (not the answer):
    • What concept, formulas, and rules did I apply?
    • What methods did I use?
    • How did I begin?
    • How does the solution compare with worked examples from the textbook or my notes?
    • Can I do this problem another way? Can I simplify what I did?
  • Explain each step in your own words. Write the explanations down.
  • Do the problem analysis with your study group or tutor. In your study group, take turns explaining things to each other.

http://www.eecs.berkeley.edu/Programs/ugrad/studytips.shtml
General Tips for Problem Sets

- It can be helpful to say out loud what you are thinking and the steps to solve the problems.
- Understanding the concept/formula/rule is the most important part, not memorizing the steps. You want to be able to apply the concept to different types of scenarios when taking an exam.
- Never look at a solution, say “That's all I was missing? I could definitely do that!” and move on. Try the problem 10 minutes later without the solution.

http://www.eecs.berkeley.edu/Programs/ugrad/studytips.shtml
**Programming Assignments**

- Read the assignment several times before starting.
- Use office hours to make sure you have a solid understanding of the concepts.
- Design your program start to finish first before you start programming.
  - What variables will you need?
  - What functions will you need?
  - What order should you do everything in?
  - Program in sections. Test before moving on to the next.

http://www.eecs.berkeley.edu/Programs/ugrad/studytips.shtml
• There are almost ALWAYS multiple ways to code any problem. See if you can think of at least two.

• Debugging ALWAYS takes more time than you think it will. DO NOT save this for right before it is due.

• Coding can seem tough at first, but if you force yourself to truly understand your first five assignments, the next 50 will be MUCH easier.
Using Flashcards

- Make flashcards early and by hand.
- Limit each card to 1 concept or definition.
- Learn the concepts forward and backward.
- Have someone else quiz you and reword the questions.
- Carry your flashcards with you so you can review them during short periods of downtime.
- Try a flashcard app that lets you download them to your phone and tracks your progress.
  - flashcardapps.info
Anticipate Exam Questions

• Be prepared for questions that ask you to think critically and apply your knowledge
  • Make sure you understand how everything fits together
  • Get comfortable comparing and contrasting, discussing differences and similarities, and identifying key themes and discussing how the themes appear or are used in different contexts
  • Keep in mind anything the professor stressed during lecture
Get Help – Early & Often!

- Study Groups
- Viterbi Academic Resource Center
  - viterbi.usc.edu/varc
- Office hours
- Supplemental Instruction
References


