Acing LSU Math Courses: 
Key Strategies that Ensure Success!

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2004 National College Learning Center Association
Frank L. Christ Outstanding Learning Center Award
The Experience of Three LSU Students

- Miriam, freshman calculus student
  37.5, 83, 93

- Robert, freshman chemistry student
  42, 100, 100, 100

- Cathy, freshman Math 1021 student
  77, 99.2
Impact of Attending CAS Workshop on Final Grade in Math 1021 for 2008 Summer Provisional Students

- 5 Students Attended workshop:
  3A’s (60%); 5 B’s (40%); 0% C’s, D,s or F’s

- 13 students did not attend Workshop:
  1 A (8%)  2 B’s (15%)  4 C’s (31%)
  3 D’s (23%)  3 F’s (23%)
Reflection Questions

■ What are the reasons that you missed points on the earlier exams? List as many as you can.

■ Do you usually use the examples to work the homework problems?

■ What’s the difference between studying and learning?
Mastering Math Takes Time

- **Biology definition**
  - Enzymes are biological catalysts, normally proteins, synthesized by living organisms.

- **Math Definition**
  - Extreme values on an Interval: Let $f(x)$ be a function on an interval $I$ and let $a \in I$. We say that $f(a)$ is the absolute minimum of $f(x)$ on $I$ if $f(a) \leq f(x)$ for all $x \in I$.
Mastering Math Requires Understanding of Symbols and Terms

- Some symbols have multiple meanings with the particular meaning determined by its context
  - The “−” is used to denote subtraction, a negative number and the opposite of a number

- Some symbols have understood parts
  - $x = 1 \times x^1$
  - $\sqrt{x} = 2\sqrt{x}$
  - $\log{x} = \log_{10} x$
You May Have to Repair Some Stepping Stones on the Path

- Some procedures may require skills or knowledge that you haven’t used recently so they need brushing up.
- Some procedures may require skills or knowledge that you need to look at in a different way.
- Some procedures may require skills or knowledge that you did not master originally.
So how do you gain the skills and knowledge now?

Use Metacognition to Become an Expert Learner!
Metacognition

The ability to:

- think about thinking
- be consciously aware of oneself as a problem solver
- monitor and control one’s mental processing (e.g. “Am I understanding this material?”)
- accurately judge one’s level of learning
This pyramid depicts the different levels of thinking we use when learning. Notice how each level builds on the foundation that precedes it. It is required that we learn the lower levels before we can effectively use the skills above.

- **Knowledge**: Memorizing verbatim information. Being able to remember, but not necessarily fully understanding the material.
- **Comprehension**: Using information to solve problems; transferring abstract or theoretical ideas to practical situations. Identifying connections and relationships and how they apply.
- **Application**: Combining information to form a unique product; requires creativity and originality.
- **Analysis**: Making decisions and supporting views; requires understanding of values.
- **Synthesis**: Identifying components; determining arrangement, logic, and semantics.
- **Evaluation**: Restating in your own words; paraphrasing, summarizing, translating.

Bloom's Taxonomy

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At what level of Bloom’s did you have to operate to make A’s or B’s in high school?

1. Knowledge
2. Comprehension
3. Application
4. Analysis
5. Synthesis
6. Evaluation
At what level of Bloom’s do you think you’ll need to be to make A’s at LSU?

1. Knowledge
2. Comprehension
3. Application
4. Analysis
5. Synthesis
6. Evaluation
Study Strategies Gold Nugget

- The Study Cycle with

  *Intense Study Sessions*
The Study Cycle

**Preview**

*Preview before class* – Skim the chapter, note headings and boldface words, review summaries and chapter objectives, and come up with questions you’d like the lecture to answer for you.

**Attend**

*Attend class* – GO TO CLASS! Answer and ask questions and take meaningful notes.

**Review**

*Review after class* – As soon after class as possible, read notes, fill in gaps and note any questions.

**Study**

*Study* – Repetition is the key. Ask questions such as ‘why’, ‘how’, and ‘what if’.
- Intense Study Sessions* - 3-5 short study sessions per day
- Weekend Review – Read notes and material from the week to make connections

**Assess**

*Assess your Learning* – Periodically perform reality checks
- Am I using study methods that are effective?
- Do I understand the material enough to teach it to others?

*Intense Study Sessions*

1. **Set a Goal** (1-2 min)
   - Decide what you want to accomplish in your study session

2. **Study with Focus** (30-50 min)
   - Interact with material - organize, concept map, summarize, process, re-read, fill-in notes, reflect, etc.

3. **Reward Yourself** (10-15 min)
   - Take a break – call a friend, play a short game, get a snack

4. **Review** (5 min)
   - Go over what you just studied
How Can You Master Math Concepts?

- Do all examples without looking at textbook solution
- Construct “problem solving protocols” for the types of problems you’ll have to solve
- Become your own tutor
- Redo each section that has been covered so far, using the textbook
- Read all theorems and definitions and practice teaching the material
Why Read Theorems and Definitions

- Theorems and definitions tell you what you can do and when you can do it.
Oh No – Not Another Problem!

- Word problems are intimidating when viewed as a whole – break it down into bits of information
- Extracting all information may require rereading the problem several times
  - What am I trying to find
  - What quantities did they give me and how do they relate to what I want to find
Roadblocks to Success in Math

- Lack of preparation
  - Not attending class
  - Not memorizing basic formulas/rules
  - Not previewing material to be covered in class

- Lack of practice

- Counterproductive Attitude
  - Anxiety
  - Lack of confidence
Stepping Stones Identified by Tutors

- Efficiently using the tutorial center by having formulas memorized and problems tried
- Starting homework well before due date
- Courage to keep trying problems, taking one step at a time
- Being very careful so as not to make mistakes
Mastering Math Takes Commitment

- Review material discussed in class daily
  - Look at not only what was done but also why it was done and what in the problem indicated that path

- Practice daily
  - Start on homework when first assigned.
  - Work carefully and neatly. Write down all steps so you can retrace steps if an error is made.
  - It is ok to make wrong steps when doing homework. You learn what will not work!
How to Avoid Mistakes on the Exams

- Write down formulas on exam before you begin (but NOT before you “start” the exam in the testing center)
- Read the directions VERY carefully; underline directions as you read them
- Survey the exam and budget your time
- Expect memory blocks
- Visualize success! You CAN ace it!!!
Keys to Success

- Motivation
- Practice
- Persistence
- Time
- Self-confidence

Don’t forget what you learned last week because it will be applied in the future!
What to do, starting now!

- Develop a schedule that includes time for working lots of problems
- Identify topics with which you are having difficulty and read the text and view Khan Academy videos of this
- Develop problem solving protocols for all types of problems in the course
- Perform cognitive restructuring (I CAN ace this course!)
Challenge to Math Students

- Metacognition Discussion – October 4, 2010
- Final Grade of A or B
- Reward: Eligible for raffle of $50 gift certificate to the LSU Bookstore!
Writing Exercise

What strategy will you use for the next three weeks?
If you don’t try it in within the next 48 hours...

... you probably never will.
“It’s the difference between knowing and doing that determines success”
Anonymous

Spend the next three weeks doing everything we’ve discussed and confidently ace your math course!
Final Note

Please visit our website at www.cas.lsu.edu. We have on-line workshops and information that will teach you additional effective study strategies. We wish you a fantastically successful semester in math!
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Unlock your excellence!!!