

**DePaul University School for New Learning
Course Syllabus**

LL 205: Quantitative Reasoning

Term and Campus: Fall 2009, Loop Campus

Dates: Tuesdays, September 15 through November 24, 2009. Note: **Eleven class meetings!**

Class Time: 6:00 – 9:00 p.m.

Credit Hours: 4

Tutoring / Office Hours: Class days 5:30 – 6:00 p.m., also via phone, email, or appointment

Faculty: Eric Thor, 5504 N. Sawyer Ave., Chicago, Illinois 60625

Phone: Day and evening 773-588-0482

E-mail: (Preferred) snlmathgeek@mac.com; or (also works) ethor@comcast.net

Competence Offered (4 credit hours):

L-6: “Can use mathematical symbols, concepts, and methods to describe and solve problems.

“1. Understands how variables are expressed and transformed through symbolic representations.

“2. Interprets complex relationships of variables expressed verbally or symbolically.

“3. Employs a mathematical process to explain or solve a problem.”

We are mandated, not just to solve problems that someone else presents to us, but also to consider and discuss situations, ask our own questions, and finally try to answer them. We seek to communicate clearly while using math to understand and influence our world.

Text and Materials: (Prices approximate. Please call me with any questions.)

- **REQUIRED: ONE shrink-wrapped ‘valuepack’ set** (Pearson / Addison Wesley, \$100, ISBN 978-0-321-20559-9), which contains these TWO items:
 - i. “Essentials of Using & Understanding Mathematics” (softcover text, 9 chapters, authors Jeffrey Bennett & William Briggs, and
 - ii. “MyMathLab.com Student Package” (website license kit with your personal ‘Access Code’).

PLEASE READ THIS: To save money and avoid aggravation:

- a. **Buy the full ‘valuepack’ set.** You need text **plus** a NEW website license kit.
 - b. **Buy a new set,** not used. The website license is only valid for one use.
 - c. **Buy at DePaul B&N bookstore.** They special-order the set from the publisher.
 - d. **Do not buy** a hardcover 13-chapter text by same authors. It’s not the same book.
- **REQUIRED: “Barron’s Mathematics Study Dictionary”** (Barron’s Educational Series, 1998, author Frank Tapon, softcover, \$15, ISBN 978-0-7641-0303-2).
 - **REQUIRED: Scientific or graphing calculator** (it helps to have at least a two-line display, \$15).

Course Requirements:

- **Attend and participate** actively every week. We get together to **do** math, not just to watch. Missing any classes is strongly discouraged.
- **Stay current** on assignments, and turn in work every week, even if it’s incomplete. You can always improve your work and turn it in again for a better grade.
- Follow DePaul University guidelines on academic integrity, as found in the Student Handbook. Summarized in three words: **“Tell the truth!”** In our math class, this means: “Get all the help you may need, but don’t turn in somebody else’s answer as your own. Do the problem yourself, and show lots of work, both to clarify your thought processes and to inform the reader.”
- **Goal:** Be able to explain the question, what you did with it, and why you believe in your answer.

Assessment:

We'll have: Eleven class meetings and ten homework assignments. Weekly group 'quiz' activities. A midterm test and a cumulative final exam. Self-paced use of internet resources.

Your term grade will be based on the following weighted factors:

40% Class attendance and participation	Be there, and be active.
30% Assignments completion	Turn in work when due; you can improve it later.
10% 'Quiz' participation	Participation outweighs scores on quizzes.
5% Use of MyMathLab.com	Watch videos, do problems, etc.
5% Midterm test	You will create your own 'Open Notes Help Sheet' to use on tests.
10% Final exam score	Exam score can pull term grade up or down at most one letter grade.

The grading scale will be:	91-100% = A	61-68% = D
	81-90% = B	0-60% = F
	69-80% = C	

[By default, the course is graded. If you want Pass/Fail grading, "C" (69% or better) is needed to pass. To be eligible for an "Incomplete" grade, you should be mostly done with all work, not way behind.]

For Extra Help:

- Use DePaul's "Blackboard," and "MyMathLab.com" websites for numerous resources.
- Acquire auxiliary math book(s). Your public library is an excellent place to start.
- Communicate with other students using our voluntary phone & email contact list, and "Blackboard."
- Organize or join a study group.
- Join us 30 minutes early on class days for voluntary tutoring and problem-solving.
- Call me with questions at any time. I am a good telephone tutor; try me and see.
- Consult John Phillips (773-871-7413), an official SNL tutor, for free math tutoring:
4:30 to 6:30 p.m. Mondays and Thursdays at Loop (just walk in), and
2:00 to 5:00 p.m. Saturdays at O'Hare (call John first for Saturdays or other arrangements).
- If all else fails: take a walk; take a nap; take a break. Amazing things can happen when you relax and let your mind get a fresh start on a problem. And, as I will repeat many times, "Don't worry." While fear *can* motivate for a while, mostly it interferes with learning and performance.

Course Description:

Our "Quantitative Reasoning" text states a triple goal: preparation for other college courses, functioning effectively in a career, and using "critical thinking" to handle issues of daily life. So math can improve our lives, but what *is* math? Again, from our text: "...look at mathematics in three ways: as the sum of its branches, as a way to model the world, and as a language." Math is huge, so we need to set priorities for this brief DePaul SNL course.

My goal is that each student be ready for life-long use and learning of mathematics at some personally appropriate level. I seek your participation, not your perfection.

We will emphasize logic, critical thinking, and financial management, because they help us choose and sail our own life courses, instead of being buffeted by storms of confusion or deception.

We will emphasize statistics and data analysis, because our society and its technologies are very dependent on collecting, processing, and using information. Each of us has the right and the responsibility to be engaged -- we really can't afford to just leave decisions up to the 'experts'.

We will emphasize arithmetic and its abstracted cousin, algebra, because they provide basic ground rules and common language for most quantitative discussions. Arising from nature itself, they have been elegantly organized and extended by human effort over thousands of years. They are the words and grammar we need to move beyond English and become (more or less fluently) bilingual using 'Math-speak'.

Your Learning Experience: Hints for success.

How fluent are you now? Many math words are also used in everyday English, usually with related meanings. I'll bet that you already know a lot more about math, and use it more often, than you realize. I'll help you see connections between previous knowledge and the curriculum of this course. While moving ahead, use your past; don't leave it behind.

I want you to be an efficient learner. Find, then hold on to, the general essence of the material, and be ready to apply it when appropriate. For example, I'll teach you the 'URDU' algorithm (set of instructions) to calculate an approximate square root of any number. Focus on the process and the context, not just the numbers, to gain much more than an answer or a particular math skill. Seek a strategic ("big-picture") understanding of all situations that involve square roots, and all recursive algorithms. You'll find that comfort with one algorithm gives you the power to open many doors.

Have you experienced math anxiety? Ever feel like the man in the cartoon (text, page 114), trapped with no way out? If so, don't give up. Even more important, don't label yourself as incompetent or incapable. Don't think that failure to move directly and confidently to a problem's solution means something is wrong with you. Instead of putting unreasonable expectations on yourself, follow some of this advice (which will be illustrated by examples as the course unfolds)...

Slow down, relax, and think. See yourself as a lucky person – a thinker with a challenging puzzle in hand and plenty of time to spend on it. You needn't rush to an answer. First, seek a solid understanding of the story presented in the problem. Realize that unstated assumptions, deliberate or unintended ambiguities, even outright errors, could all mis-direct you. A chosen road may lead you to a dead-end. If so, just turn around, backtrack, and re-examine the context while you ponder a new start.

Look for options to break down, or skip around, barriers. Often, we can **translate** the same material between numerical, symbolic, physical, geometric, pictorial, chart, or (gasp!) word problem formats. Skills or insights from one system may help us understand and function in other systems. We start to create our own path through the wilderness. Then math becomes fun and exciting!

Experiment with these **problem-solving strategies**, to get more done, with less grief: Look at the big picture. Categorize and organize. Make drawings/charts/graphs/physical manipulatives. State the obvious. Carry to extremes. Guess-check-adjust. Doodle. Engage in wishful thinking. Work backwards. 'Mask' your troubles (postpone the difficult). Pause for a quick reality check ('QRC'). And always confirm that a proposed answer really works by checking back in the original question.

Use memory aids, because memory fades. Don't pretend to have the proverbial 'photographic memory'. Do build, and use, a toolkit of reminders. Take notes, use acronyms or other reminder cues, and learn how to re-create that which was known but later forgotten. We'll share study and memory aids, always aware that the 'best' aid is the one that works well for you.

Your Action Plan: Establish the habit of thinking quantitatively every day.

Ideally, sit down and work on this course for at least **one hour every day**. And think about math during other times, such as while taking a walk, riding the bus, reading a newspaper, watching TV, eating, washing dishes, or preparing to sleep. Mull over a problem you are stuck on, think up new questions, or review old material. Focus more on the **stories** than on the numbers. As one poet said, "The universe is made of stories, not atoms."

We'll **exercise** our minds using multiple learning styles, the academic equivalent of cross training in physical sports. Read each section of your text at least twice. Talk things out in groups; do and turn in homework weekly. Make brief presentations to class or to a small group. Start now on your 'Open Notes Help Sheet' to use during the midterm test and final exam. Reading, listening, or watching are all valuable. Sharing, talking, and doing are invaluable. I hope your mind gets a well-rounded workout in several venues every week.

Most important: **don't worry**. Worrying wastes energy. Use your valuable energy productively to build up understanding and skill. **Think about solving problems, not about having problems.**

Week-by-Week: “Schedule of Topics --- Text & Dictionary References”

(See page 5.)

COMMENTS:

Specific assignments will be given during the term. To prepare for Day #1, read the indicated text and do a few exercises. (Your text includes answers for odd-number exercises. Use them for guidance, but please, don't ever just copy them!)

Barron's Dictionary page references are chosen to enhance understanding of each week's topics. Please look at them regularly, but there are no actual problems or assignments from the dictionary. Naturally, you are also encouraged to browse other parts of the dictionary at any time.

Optional book references will point you to just a few of the many excellent books that could help increase your mastery and enjoyment of quantitative material. You might find them, or others that are equally valuable, in a library or bookstore.

Your Instructor: Eric Thor

I believe strongly in lifelong learning and teaching. For more than 30 years, I've taught mathematics in Chicago high schools and other situations. I've also taught sailing, other outdoor activities, environmental awareness, and computer applications to adults and to children. At various times, I've worked in manufacturing, sales, and stock market investing.

I'm still learning. I read a lot, especially on historical, psychological, and science topics. I enjoy television – favorites include the History and Comedy Channels, public television, Book TV (weekends on C-SPAN2), and last but not least, Turner Classic Movies. I pay attention to ads and commercials, and often react to the faulty and/or deceptive logic found therein.

Sailing, sports, gardening, travel, friends, family, and food bring me great pleasure. Environmental degradation, uncontrolled climate change, over-population, and use/misuse of scarce or dangerous resources are my greatest concerns.

Guess what? Everywhere I look, I find applications of logic and math, which may help explain why my love for these fields has grown through the years, not diminished.

My degrees are B.A. History, and M.A. Teaching Mathematics, both from the University of Illinois at Chicago. “Thank you!” to professors Grant O. Gale, A. I. ‘Izzy’ Weinzweig, Irwin K. ‘Bud’ Feinstein, and others who educated and inspired me in so many ways.

I hope that, as years go by, when you use a skill or strategy that was emphasized in this course, you will have enough confidence in your own understanding to share it with someone else. Then please feel free to call or write and tell me about your experience. Hearing from former students is one of the great joys of being a teacher.

Schedule of Topics with Text & Dictionary References

Fall 2009 Tuesdays DePaul SNL, Loop Campus, LL 205 Quantitative Reasoning Eric Thor

Day #	Class Date	Text: Units & Topics	Dictionary: Pages & Topics
1	Sept. 15	Preface: "To the Student" Prologue: Literacy 1-A Fallacies 1-B Propositions, Truth	34-35 Eponyms 52-55 Logic 100-101 Symbols 122-127 Words
2	Sept . 22	1-C Sets, Venn Diagrams 1-D Critical Thinking 2-A Units, Conversion Factors, Fractions	2-3 Abbreviations 6-11 Algebra 14-15 Arithmetic: Basics 40-41 Fractions, Ratios, Percents 66-67 Number Sets 86-87 Sets 116-119 Units, Conversions, SI (Metric Sys.)
3	Sept . 29	2-B Standardized Units 2-C Problem-Solving	36-37 Factors, Multiples, Primes 50-51 Kinematics (Motion) 62-65 Number Forms, Systems 98-99 Structures, Operations 106-107 Temperature
4	Oct. 6	3-A Proportion, Percentage 3-B Large or Small Numbers	16-19 Arithmetic: Commercial, 4 Rules 48-49 Bits and Bytes 110-111 Scale Factors
5	Oct . 13	3-C Uncertainty, Errors 3-D Deception, Interpretation Mid-Term Test	4-5 Accuracy, Significant Digits 104-105 Techniques, Algorithms, Proportions
6	Oct 20	4-A Compound Interest 4-B Savings Plans 4-C Loans, Credit Cards	14-17 (Again) Arithmetic 62-63 (Again) Exponents
7	Oct 27	7-A Linear vs. Exponential Growth 7-B Doubling Time & Half-Life 7-C Exponential Modeling	46-47 Graphs 68-69 Pi, Approximations 128 x, y, z Inside Covers: Digits of Pi
8	Nov. 3	5-A Statistics Fundamentals 5-B Believe a Study Report? 5-C Tables, Graphs	12-13 Angles 22-23 Circles 28-29 Coordinate Systems 90-97 Statistics
9	Nov. 10	5-D Graphics 5-E Correlation, Causality 5-F Data Distributions	102-103 Symmetry 114-115 Sine Function Graph
10	Nov. 17	Q & A, Review & Consolidate Begin Final Exam	Review all the above pages.
11	Nov. 24	Q & A, Review & Consolidate Finish Final Exam	60-61 Number Diversions